



STATE OF MINNESOTA

COASTAL NONPOINT POLLUTION

CONTROL PROGRAM

ENVIRONMENTAL ASSESSMENT

Office of Ocean and Coastal Resource Management
Coastal Programs Division
1305 East-West Highway
Silver Spring, MD 20910

January 2003

U.S. DEPARTMENT OF COMMERCE

Donald L. Evans, Secretary

National Oceanic and Atmospheric Administration

Conrad C. Lautenbacher Jr., Under Secretary for Oceans and Atmosphere

National Ocean Service

Jamison S. Hawkins, Acting Assistant Administrator for Ocean Services
and Coastal Zone Management

DESIGNATION: Environmental Assessment

TITLE: State of Minnesota Coastal Nonpoint Pollution Control Program

ABSTRACT: This environmental assessment is prepared pursuant to the National Environmental Policy Act (NEPA), 42 U.S.C. 4321 et seq. to assess the environmental impacts associated with the approval and implementation of the Coastal Nonpoint Pollution Control Program (coastal nonpoint program) submitted to NOAA and EPA by the state of Minnesota. Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), 16 U.S.C. section 1455b, requires states and territories with coastal zone management programs that have received approval under section 306 of the Coastal Zone Management Act to develop and implement coastal nonpoint programs.

For purposes of this environmental assessment, the proposed action is the conditional approval of the Minnesota coastal nonpoint program. The Minnesota program includes management measures and enforceable policies and mechanisms for the agricultural, forestry, marinas, hydromodification, and wetlands, riparian areas and vegetated treatment systems nonpoint source categories, and for most aspects of the urban development category. Minnesota requested an exclusion for the irrigation water management measure for irrigated agricultural lands. NOAA and EPA find that the State has provided sufficient justification for this exclusion. The boundary of the 6217 management area proposed by Minnesota is the Lake Superior Basin boundary, the same as NOAA's recommendation for coastal watersheds.

NOAA and EPA find that the Minnesota program meets most of the requirements of section 6217 and propose to approve the program with conditions. To receive final approval of its program, Minnesota will need to meet the conditions, which include completing development of certain aspects of its program addressing the new development management measure and providing a description of the process by which areas of the Lake Superior Basin will be targeted for additional management measures. The conditional approval of the Minnesota coastal nonpoint program will not result in any significant environmental impacts different from those analyzed in the Programmatic Environmental Impact Statement prepared for the 6217 program and will have an overall beneficial effect on the environment.

LEAD AGENCY: U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service

COOPERATING AGENCY: U. S. Environmental Protection Agency
Office of Water
Washington, D.C. 20460

CONTACT: John King, Acting Chief, Coastal Programs Division
1305 East-West Highway - SSMC/4
Silver Spring, MD 20910
(301) 713-3155 Ext. 188

Minnesota
COASTAL NONPOINT POLLUTION CONTROL PROGRAM

TABLE OF CONTENTS

EXECUTIVE SUMMARY	<u>PAGE</u>
1. OVERVIEW	
1.A Background	1
1.B Purpose and Need for Action	1
2. ALTERNATIVES	
2.A Approve Minnesota Program	3
2.B Conditionally Approve Minnesota Program	4
2.C Deny Approval of Minnesota Program	6
3. AFFECTED ENVIRONMENT	
3.A The Physical Environment	8
1. The Minnesota 6217 Management Area	8
2. Lake Superior Coastal Environment	8
3.B Terrestrial Environment and Land and Water Uses	10
1. Population	11
2. Social and Economic Activities	11
4. ENVIRONMENTAL CONSEQUENCES	
4.A Management Measures Implementation	17
1. Environmental Impacts	17
a. Agriculture	17
b. Urban Runoff	20
c. Forestry	29
d. Marinas	33
e. Hydromodification	37
f. Wetlands, Riparian Areas, Vegetated Treatment Systems	41
2. Socioeconomic Impacts	43
4.B Program Implementation	45
1. Environmental Impacts	45
a. Coordination with Existing State Programs	45
b. Coastal Zone Boundaries and 6217 Management Area	46
c. Implementation of Management Measures	46
d. Implementation of Additional Management Measures	47
e. Technical Assistance	47
f. Public Participation	48

g. Administrative Coordination	48
h. Monitoring	49
i. Enforceable Policies and Mechanisms	49
2. Socioeconomic Impacts	50
4.C Environmental/Socioeconomic Impacts of Alternatives	51
4.D Unavoidable Adverse Environmental Impacts	52
4.E Relationship Between Short-Term Uses of Environment and Enhancement of Long-Term Productivity	53
4.F Irreversible and Irretrievable Commitment of Resources	53
5. LIST OF PREPARERS	54
6. LIST OF AGENCIES AND PERSONS CONSULTED	54
7. FINDING OF NO SIGNIFICANT IMPACT	54
8. REFERENCES	58
9. APPENDIX A - Management Measures for Sources of Nonpoint Pollution in Coastal Waters	61

LIST OF FIGURES

	<u>PAGE</u>
Figure 1. Minnesota 6217 Management Area	8A

LIST OF TABLES

Table 1. Wetland Coverage in Lake Superior's Major Minnesota Watersheds	9
Table 2. Change in Population in the Lake Superior Basin Counties, 1990-2000	11
Table 3. County 1997 Farm Statistics	12
Table 4. Total Timber Cut in 1996	13
Table 5. Marinas and Selected Related Facilities in Minnesota's Lake Superior Basin	14
Table 6. State Records For Recreational Fish Caught in Coastal Counties	16

EXECUTIVE SUMMARY

The National Oceanic and Atmospheric Administration (NOAA) has prepared this environmental assessment to assess the environmental impacts associated with the approval and implementation of the coastal nonpoint pollution control program (coastal nonpoint program) submitted to NOAA and Environmental Protection Agency by the state of Minnesota. Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), 16 U.S.C. section 1455b, requires states and territories with coastal zone management programs that have received approval under section 306 of the Coastal Zone Management Act (CZMA) to develop and implement coastal nonpoint programs. These programs were required to be submitted to NOAA and EPA in July 1995. Once approved, these programs will be implemented through changes to the state nonpoint source program approved by EPA under section 319 of the Clean Water Act and through changes to the state coastal zone management program approved by NOAA under the CZMA.

For purposes of this environmental assessment, the proposed action is the conditional approval of the Minnesota coastal nonpoint program. The alternatives to the proposed action are to approve the program or to deny approval of the program.

The Minnesota program includes management measures and enforceable policies and mechanisms for the agricultural, forestry, marinas, hydromodification, and wetlands, riparian areas and vegetated treatment systems nonpoint source categories, and for most aspects of the urban development category. Minnesota requested, and NOAA and EPA approved, an exclusion for the irrigation water management measure for irrigated agricultural lands. The boundary of the 6217 management area proposed by Minnesota is the Lake Superior Basin boundary.

NOAA and EPA find that the Minnesota program meets most of the requirements of section 6217 and propose to approve the program with conditions. To receive final approval of its program, Minnesota will need to meet the conditions, which include completing development of certain aspects of its program addressing the new development management measure and providing a description of the process by which areas of the Lake Superior Basin will be targeted for additional management measures.

NOAA and EPA have determined that the conditional approval of the Minnesota coastal nonpoint program will not result in any significant environmental impacts different from those analyzed in the Programmatic Environmental Impact Statement prepared for the 6217 program and that this alternative will have an overall beneficial effect on the environment.

1. OVERVIEW

1.A Background

In 1990, Congress enacted section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), entitled "Protecting Coastal Waters", to help address the problem of nonpoint source pollution and its effect on coastal waters. The purpose of the section is to strengthen the links between Federal and state coastal zone management and water quality programs in order to enhance state and local efforts to manage land use activities that degrade coastal waters and habitats. Section 6217 requires states and territories with federally approved coastal management programs to develop coastal nonpoint pollution control programs (coastal nonpoint programs) and submit them to the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA) in July 1995 for approval. Once approved, these programs will be implemented through changes to the state nonpoint pollution program approved by EPA under section 319 of the Clean Water Act (CWA) and through changes to the state or territorial coastal zone management program approved by NOAA under the CZMA.

Section 6217 utilizes a two-tiered management approach for the control of nonpoint sources of pollution. The purpose of the first tier is to protect coastal waters generally. It requires that states and territories implement, at a minimum, management measures in conformity with guidance (known as the 6217 (g) guidance, or management measure guidance) that was developed by EPA in consultation with NOAA and other Federal agencies. The management measures developed by EPA address the nonpoint pollution source categories of agricultural runoff, urban runoff, forestry runoff, hydromodification, and marinas. Management measures must also be implemented for wetlands protection, riparian areas, and vegetated filter strips. Once the first tier of management measures is implemented to protect coastal waters generally, the state or territory will need to develop additional management measures to apply, as necessary, to meet water quality standards and protect designated uses.

1.B Purpose and Need for Action

In March 1996, NOAA published a programmatic environmental impact statement (PEIS) that assessed the environmental impacts associated with the approval of state and territory coastal nonpoint programs (NOAA, 1996). The PEIS forms the basis for the environmental documents NOAA is preparing on each state and territorial coastal nonpoint program submitted for approval. In the PEIS, NOAA determined that the approval and conditional approval of coastal nonpoint programs will not result in any significant adverse environmental impacts and that these alternatives will have an overall beneficial effect on the environment. The analyses presented in the PEIS are incorporated by reference into this environmental assessment (EA).

NOAA has prepared this EA to assess the environmental impacts associated with the approval and implementation of the coastal nonpoint program submitted to NOAA and EPA by the state of Minnesota in July 2001. The Minnesota program will be approved after a joint NOAA/EPA review if it meets all of the requirements of section 6217 as specified in the statute

and in the program guidance documents. The analysis in this EA also serves to determine whether the impacts associated with program approval are significantly different from those analyzed in the PEIS, so as to require the preparation of an environmental impact statement (EIS).

In May 1999, NOAA prepared a final environmental impact statement (FEIS) on the Minnesota coastal management program submitted for approval under the CZMA (NOAA/Minnesota DNR, 1999). The Minnesota coastal management program establishes the boundaries of the Minnesota coastal area within which the program applies; describes the organizational structure to implement the program; and provides a set of statewide policies applicable to all state and Federal agencies which manage resources along the state's coastline. The information in the FEIS is relevant to this analysis because the section 6217 coastal nonpoint program is to be implemented through the Minnesota coastal zone management program, as well as its section 319 Clean Water Act program. Therefore, the Minnesota FEIS is incorporated by reference into this EA.

2. ALTERNATIVES

For purposes of this environmental assessment, the proposed action is the conditional approval of the Minnesota coastal nonpoint pollution control program. The alternatives to the proposed action are to approve the program without conditions or to deny approval of the program. The proposed action, its alternatives, and a summary of their environmental consequences are described below.

2.A Approval of Minnesota Coastal Nonpoint Program

To assist states and territories in the development of their coastal nonpoint programs, NOAA and EPA jointly published a guidance document, Program Document and Approval Guidance (NOAA/EPA, 1993). The state and territory programs will be approved after a joint NOAA/EPA review if they meet all of the requirements of section 6217 as specified in the statute and in the program guidance documents. Specifically, the Minnesota program must contain the following components:

- o Coordination with Existing State Programs
- o Determination of the 6217 Management Area
- o Implementation of Management Measures in Conformity with (g) Guidance
- o Identification and Implementation of Additional Management Measures
- o Technical Assistance
- o Public Participation
- o Administrative Coordination
- o Identification of Enforceable Policies and Mechanisms

The alternative of approving the Minnesota coastal nonpoint program would generally be expected to have a beneficial effect on the environment because the program would help to control sources of nonpoint pollution and would result in fewer pollutants reaching the state's coastal waters. Hydromodification activities are a source of nutrients and suspended solids that contribute to the use impairment of sections of the St. Louis river. The loss of wetlands has had significant effects on the urban watersheds of Duluth's Miller creek and the Duluth/Superior Harbor (Minnesota Environment, 2000). The program will help to restore activities in these rivers and other coastal areas which have been adversely affected by human activities. The nonpoint program will also make existing programs more effective by strengthening the link between Federal and Minnesota state coastal zone management and water quality programs. In their review of the Minnesota program, NOAA and EPA have found that the program does not meet all of the requirements of section 6217. Therefore, full approval of the Minnesota coastal nonpoint program is not a feasible alternative. The rationale for this decision is discussed below under the conditional approval alternative. However, as discussed below, the conditional approval alternative is expected to result in the same environmental benefits as the approval alternative, provided Minnesota satisfies the conditions.

2.B Conditional Approval of Minnesota Coastal Nonpoint Program [Preferred Alternative]

While NOAA and EPA expect the coastal nonpoint programs submitted for approval to meet all of the requirements of section 6217, NOAA and EPA realize that in some situations, a program may require changes before final approval can be granted. In these situations, NOAA and EPA will grant conditional approval in order to provide states and territories an opportunity to make necessary changes. Conditional approvals are intended primarily to provide additional time to:

- (1) address identified gaps, including obtaining new statutory or regulatory authority, if necessary;
- (2) demonstrate that existing authorities are adequate for ensuring implementation of the management measures; and,
- (3) develop other incomplete program components.

NOAA and EPA will provide up to five years from the time of conditional approval for completion of a coastal nonpoint program. The length of the conditional approval will depend on which program components are subject to conditions and how long it will take to finalize those components.

NOAA and EPA find that the Minnesota coastal nonpoint program meets most of the section 6217 requirements and adequately addresses all program components with the exception of the following components. The state will be able to receive final approval of its program by meeting the conditions described below for each component.

(1) Urban - New Development

Minnesota's program does not include a management measure for new development in conformity with the Section 6217(g) guidance throughout the 6217 management area. The state has also not demonstrated that post-development total suspended solid (TSS) loadings will be designed to a level no greater than pre-development loadings. In order to receive final approval, the program must meet the following condition:

- Within two years, Minnesota will demonstrate that all areas within the Lake Superior Basin not subject to the State Shoreland Management Act (M.S. 103F) or subject to Phase I or II of the NPDES municipal separate storm sewer systems program will implement the Section 6217(g) new development management measure via water plans or some other mechanism. Within two years the State will also demonstrate through a pilot project or further data/information sharing with NOAA/EPA that its management practices taken in combination provide for 80 percent TSS reduction by design or performance.

(2) Urban - Watershed Protection, Site Development and Construction Site Erosion and Sediment Control

Minnesota's program includes management measures in conformity with the Section 6217(g) guidance and enforceable policies and mechanisms to implement the watershed protection and site development measures in all areas that have adopted the M.S. 103F

requirements, but not throughout the remainder of the 6217 management area. Minnesota has provided a legal opinion concluding that the state has the authority to prevent nonpoint source pollution and require implementation as necessary. Minnesota has included descriptions of the voluntary and incentive-based programs the state will use to encourage implementation of the measures. The state has not, however, provided an acceptable description of the mechanism or process linking the implementing agency with the enforcement agency, nor has it demonstrated a commitment to use the existing enforcement authority where necessary. In order to receive final approval, the State must meet the following condition:

- Within two years, Minnesota will demonstrate how the State ensures implementation of the watershed protection and site development measures throughout the entire 6217 management area when the Local Government Unit (LGU) does not implement the management measures. Particular emphasis should be provided for those elements of the measures designed to be preventive. Within two years, Minnesota will also provide an acceptable description of the mechanism or process linking the implementing agency with the enforcement agency, and a commitment to use the existing enforcement authorities where necessary.

(3) Urban - Existing Development

Minnesota's program does not include management measures in conformity with the Section 6217(g) guidance and enforceable policies and mechanisms to implement the existing development measure. Minnesota has not explicitly described how the existing development measure will be met throughout the entire 6217 management area, nor has it submitted a priority list and schedule for conducting retrofits. Minnesota is not required to include the Existing Development Management Measure for any existing development within urbanized areas subject to NPDES Phase I or Phase II MS4 permits. In order to receive final approval, the State must meet the following conditions:

- Within two years, Minnesota will include in its program management measures in conformity with the Section 6217(g) guidance for existing development and demonstrate how the program includes enforceable policies and mechanisms to ensure implementation throughout the 6217 management area. NOAA and EPA request that Minnesota provide, within two years, a list of retrofit opportunities in the 6217 management area and a schedule for implementing retrofits. Minnesota should also provide examples of how watershed management programs are addressing the priorities identified in the 6217 management area (through implementation of the existing development management measures).

(4) Urban - Roads, Highways, and Bridges: Operations and Maintenance

Minnesota's program does not include management measures in conformity with the Section 6217(g) guidance and enforceable policies and mechanisms to ensure implementation for local roads. Minnesota is not required to include the Road, Highway, and Bridge Operation and Maintenance Management Measures for any road, highway, and bridge operation and maintenance in urbanized areas subject to Phase I or Phase II NPDES MS4 permits. In order to receive final approval, the State must meet the following condition:

- Within two years, Minnesota will demonstrate how the MDNR Protected Waters Permit Program, or another State program, ensures implementation of the practices contained within

this Section 6217(g) measure for all local roads, highways, and bridges, including roads and highways that do not cross waterbodies, outside of designated MS4 areas.

(5) *Technical Assistance*

Minnesota's CNP describes extensive efforts to provide technical assistance across all management measures that are acceptable to NOAA and EPA. The State, however, does not specify how technical assistance will be directed toward the implementation of additional management measures.

- Within two years, Minnesota will include methods in its CNP that demonstrate how technical assistance will be provided to local governments and the public for the implementation of additional management measures.

(6) *Additional Management Measures*

Minnesota's description of monitoring and assessment information is adequate, however, NOAA and EPA need more detail regarding the process by which additional management measures will be developed and implemented.

- Within two years, Minnesota will provide for the identification of additional management measures and the continuing revision of management measures applicable to critical coastal areas in cases where Section 6217(g) measures are fully implemented but water quality threats or impairments persist.

The alternative of conditionally approving the Minnesota coastal nonpoint program is expected to have the same beneficial results as would full approval and will avoid the adverse impacts associated with denial of approval, provided Minnesota satisfies the conditions. The immediate implementation of the completed portions of the program will begin to fulfill the intent of section 6217 by helping to control sources of nonpoint pollution thus resulting in a reduction of pollution reaching coastal waters. Positive socioeconomic benefits will accrue as improvements in coastal water quality resulting from controlling nonpoint pollution increase the aesthetic value of coastal areas thereby benefitting tourism and providing enhanced opportunities for boating and swimming and other water related activities. Improvements in water quality are also likely to improve commercial and recreational fishing. There may be some localized socioeconomic impacts from implementation of the management measures because of restrictions that may result from designation of critical coastal areas.

2.C Deny Approval of Minnesota Coastal Nonpoint Program [No Action]

The decision to deny approval of a coastal nonpoint program has the same effect as the "no action" alternative under the National Environmental Policy Act. Although section 6217 requires states to develop and implement coastal nonpoint programs, approval of the programs is not assured until NOAA and EPA find that all the requirements of section 6217 have been met. Denial of approval of a program will have the effect of relying on existing nonpoint control efforts and levying financial penalties on both the state's coastal zone management program under the CZMA and the state's nonpoint pollution program under section 319 of the Clean Water Act. The schedules for such penalties are stipulated in section 6217(c) of the CZARA.

The denial of program approval and the imposition of financial penalties may have an adverse environmental effect because it may cause Minnesota not to implement management measures that are meant to control coastal nonpoint pollution, restore degraded waters, and protect critical coastal areas.

Although the majority of Minnesota's coastal waters fully support designated uses, including fishing and swimming, there are numerous examples of how nonpoint pollution has caused water quality problems in Minnesota. According to Minnesota's 2000 305(b) Report to Congress, hydromodification activities are the source of nutrients that are contributing to the use impairment of sections of the St. Louis River and construction activities are listed as the source of nutrients contributing to the use impairment of a section of the Poplar River. The St. Louis River Remedial Action plan identified nutrient and sediment loading as problems in the St. Louis Bay Area of Concern (Minnesota Pollution Control Agency, 2000c).

NOAA and EPA have reviewed the Minnesota coastal nonpoint program and found that the program meets most of the requirements of section 6217. Therefore, denying approval of the program is not the preferred alternative.

3. AFFECTED ENVIRONMENT

As required by section 6217(a), the geographic scope of each coastal nonpoint program must be sufficient to ensure implementation of management measures to "restore and protect coastal waters." Pursuant to section 6217(e), NOAA, in consultation with EPA, made recommendations to each state and territory on the geographic scope of its program (also known as the "6217 management area"). This recommendation was based on the extent of coastal watersheds in each state and territory. States and territories were not required to adopt NOAA's exact boundary recommendation; they could propose an alternative 6217 management area at the time of program submission.

The boundary of the 6217 management area proposed by Minnesota is based on NOAA's recommendation of coastal watershed boundaries and therefore encompasses Minnesota's entire Lake Superior watershed.

Because the actual geographic scope of each coastal nonpoint program was unknown during the preparation of the PEIS, that document used NOAA's original recommendation - coastal watersheds - for purposes of generally describing the environment to be affected. The description of the environment in the PEIS was of a general nature because of the widely diverse areas encountered across all of the twenty-nine states and territories that were expected to submit coastal nonpoint programs. The following is a more specific description of the environment in the Minnesota 6217 management area, based mainly on the EIS prepared by NOAA and Minnesota during approval of Minnesota's coastal zone management program (NOAA/Minnesota DNR, 1999), and the Minnesota coastal nonpoint program submission (Minnesota's Lake Superior CNPCP, August 2001).

3.A The Physical Environment

1. The Minnesota 6217 Management Area

As stated above, NOAA selected coastal watersheds as its basic recommendation for all state and territory 6217 management areas. After evaluating all coastal watersheds in Minnesota for significant indicators of pollution potential, NOAA and EPA recommended to Minnesota that a 6217 management area based on watershed boundaries which is necessary "to control sources of pollution that, individually or cumulatively, significantly impact the state's coastal waters". Based on the NOAA/EPA recommendation, the Minnesota 6217 management area follows watershed boundaries and its coastal nonpoint pollution control program will therefore be implemented on a watershed basis. Minnesota's proposed boundary for the 6217 management area is sufficient to control the land and water uses that have or are reasonably expected to have a significant impact on Minnesota's coastal waters. Figure 1 shows Minnesota's section 6217 management area.

2. Lake Superior Coastal Environment

Lake Superior is the largest of the Great Lakes and has the greatest surface area of any freshwater lake in the world. The lake extends approximately 350 miles from the west to east,

and 160 miles north to south, and has a shoreline almost 2,800 miles long. With an average depth approaching 500 feet, Lake Superior also is the coldest and deepest (1,332 feet) of the Great Lakes. The Lake Superior Watershed is generally categorized by two major drainage basins, the St. Louis River Basin and the Lake Superior North Shore Basin (Minnesota's Lake Superior CNPCP, August 2001). Within the immediate vicinity of the lake, elevations vary from 602 feet above sea level at Lake Superior to 1,770 feet near Grand Marais. The 179 mile St. Louis River is the largest United States tributary flowing into Lake Superior.

The current landscape results largely from glacial activity during the Quaternary Period (2 million years ago to the present) when Minnesota saw the advance and retreat of several major, successive periods of continental ice sheets. The glaciers carved the land, leaving deposits of till (unconsolidated deposits of clay, sand, gravel, and boulders) covering the bedrock. Boulders, exposed lava flows, rock outcrops, hills, lakes, peatlands, bogs, and large areas of forest characterize this northeastern area of Minnesota. Ice blocks that broke off from glaciers melted slowly under the glacial till and formed many of Minnesota's lakes.

According to the most recent available figures, the state of Minnesota has more than 15,000 lakes; 63,000 miles of natural rivers and streams; 23,000 miles of drainage ditches and channelized watercourses; and more than 10 million acres of wetlands, including peatlands, marshes, sloughs, brushy swamps, forested lowlands, and wet meadows (Minnesota DNR, 2001a). St. Louis County with 1,325,692 acres has the greatest amount of wetlands in the coastal area. Lake County has 362,513 acres while Carlton and Cook counties have 192,721 and 162,281 acres, respectively (Minnesota DNR, 2001b). The St. Louis River, Cloquet River, Nemadji River, and the various North Shore river watersheds are rich in wetlands and water bodies. Table 1 summarizes the information on wetland and lake coverage.

Table 1. Wetland Coverage in Lake Superior's Major Minnesota Watersheds					
Coverage (Acres)	North Shore	St. Louis	Cloquet	Nemadji	Total
Wetlands	256,752	752,035	170,346	41,653	1,220,786
Total Watershed	1,424,091	1,825,257	507,844	177,767	3,934,959
% Wetlands	18	41.2	33.5	23.4	31
% Lake Area	4.3	1.9	4.5	0.8	3

Source: NOAA/Minnesota DNR. 1999

The four coastal counties are located in the Arrowhead Region of Minnesota. The 11 million acre Arrowhead area is subdivided into 10 unique agroecoregions primarily based upon

distinctions between soil types and geologic parent material, slope steepness, natural and artificial internal drainage, and erosion potential (University of Minnesota, 2000a). Each agroecoregion contains unique physiographic factors that influence the potential for production of nonpoint source pollution and the potential for adoption of land use management practices. St. Louis County is the most diverse of the counties, possessing eight of the 10 agroecoregions. It is characterized by the glacial drift and bedrock complex, the steeper till, the north shore moraine, the steep dryer moraine, the alluvium and outwash, and the poorly-drained and somewhat poorly-drained lake sediments regions, and the Mesabi Range. The Mesabi Range - a belt of iron ore 110 miles long, averaging 1 to 3 miles wide, and reaching a thickness as great as 500 feet - is located between Grand Rapids and Babbitt in St. Louis County. Cook County is the least diverse containing only the drift and bedrock complex and glacial moraine regions.

Although there are 3 distinct ecological regions in Minnesota, only the Coniferous Forest region is located in the 4 coastal counties.

St. Louis County is the largest county and covers an area of 4,258,030 acres. Carlton County is the smallest with an area of 269,510 acres. Lake and Cook counties are 1,463,000 acres and 1,031,722 acres, respectively.

Climate

Lake Superior's influence gives the North Shore a maritime climate, making it warmer in winter and cooler in summer than nearby inland areas. The lake also causes differences between the shore and inland areas in daily weather conditions like air temperature, cloud cover, and wind. Cold winters and cool summers caused by Arctic air masses and the moderating effect of the lake result in extreme temperature variations. Temperatures range from more than 100 degrees in the summer to 50 degrees below zero in the winter. Average annual precipitation increases from west to east and varies from 24 to 30 inches along the North Shore and from 28 to 30 inches in Carlton County (University of Minnesota, 2000b). Though spring and fall precipitation patterns follow the rest of Minnesota, summer and winter precipitation differs as it is influenced by the lake. Near shore land is often warmer in the fall and early winter and colder in the spring and summer. If the lake freezes over in winter the warming influence is largely lost for the year. In the summer, land quickly becomes warmer than the water and fog is often found on the lake and nearby shoreline.

3.B Terrestrial Environment and Land and Water Uses

This section provides a description of the terrestrial environment and the land and water users and uses in the Minnesota 6217 management area. The Minnesota coastal zone supports extensive and varied commercial and recreational activities. The intensity and nature of land and water uses in many areas has threatened and degraded coastal water quality.

1. Population

Most of Minnesota's Lake Superior Basin is sparsely populated with over half of the land area having a density of less than 10 people per square mile. The most recent population estimates from the U.S. Census Bureau indicate that the estimated population of the 4 counties in Minnesota's 6217 management area was 248,425 (U.S. Census Bureau, 2000). This represents approximately a 12.4 percent increase in population since 1990. During this time period, population in the two most populated counties (Carlton and St. Louis) increased 8.2 and 1.2 percent, respectively. The population of Cook County increased 33.6 percent, the largest increase of all the counties, while Lake County increased 6.2 percent.

Table 2. Change in Population in the Lake Superior Basin Counties, 1990-2000			
COUNTY	1990 Census	2000 Census	% Change
Carlton	29,259	31,671	8.2
Cook	3,868	5,168	33.6
Lake	10,415	11,058	6.2
St. Louis	198,213	200,528	1.2

Source: U.S. Census Bureau, 2000

2. Social and Economic Activities

The type and extent of land and water uses in the 6217 management area is an indication of the pollutants entering Minnesota coastal waters and the extent to which the environment of the surrounding watershed has been altered. The development of urban, agricultural, and forested lands and the activities associated with them alter the landscape and generate most of the pollutants entering coastal waters.

a. Agriculture

Minnesota's four coastal counties are characterized by diverse soils and terrain which confer unique limitations and potentials for crop and animal production. Although only 3 percent of the total acreage in the Lake Superior Basin is agricultural and nearly all the agriculturally suitable land in the coastal area, with the exception of Carlton County, is between Duluth and Two Harbors, the four coastal counties still produce a variety of commercial agricultural products. These products include wild rice, hay, forage, silage, nuts, berries, nursery and greenhouse crops, Christmas trees, mushrooms, sod, ginseng, herbs, maple syrup, eggs, milk, cheese, butter, cattle and calves, hogs and pigs, poultry, sheep and lambs, horses and ponies, goats, mink, and bees and honey. Grazing is important in the St. Louis Watershed, where there are over 60 livestock operations (Minnesota's Lake Superior CNPCP, August, 2001).

As shown in Table 3, St. Louis and Carlton counties were the leading counties in the number of acres of harvested cropland and in the market value for agricultural products in 1997. Oats were the leading product harvested in these 2 counties. All of the cropland in Cook and Lake counties is used for producing hay.

Table 3. County 1997 Farm Statistics			
COUNTY	Number of Farms	Harvested Cropland	Market Value \$
Carlton	477	39,376 acres	8,451,000
Cook	11	538 acres	101,000
Lake	26	1,098 acres	124,000
St. Louis	599	62,624 acres	9,679,000

Source: Census of Agriculture, 1997

b. Forestry

Northeastern Minnesota is the most heavily forested region of the state; Cook, Lake, St. Louis and Carlton Counties are 84 percent forested. This area originally comprised many coniferous stands of eastern white pine, jack pine, red pine, white spruce, black spruce, northern white cedar, tamarack, and balsam fir. Disturbances from logging activities and fire have altered the composition of the forest, producing forests dominated by hardwoods and aspen. The land adjacent to Lake Superior has a forest mix of aspen-birch, spruce-fir, maple-yellow birch, and white-red-jack pine. The aspen-birch extends the entire length of the North Shore. Spruce-fir forests are concentrated in Cook County, and maple-yellow birches are concentrated in Lake County.

The Coniferous Forest is the largest of the 3 ecological regions found in Minnesota. It covers two-fifths of the state, including the four coastal counties. Through its Scientific and Natural Areas (SNA) program, Minnesota's Department of Natural Resources preserves natural features and rare resources of exceptional scientific and educational value. Sixteen SNAs are located in the Coniferous Forest region. Big Island SNA in St. Louis County is home to old-growth communities, including hardwood-conifer forest and aspen-birch forest. Lutsen SNA in Cook County has one of the largest known acreage of essentially undisturbed upland old-growth hardwood forest on the North Shore. Sugar maples dominate the hardwoods; many individual trees are from 145 to 300 years old. Kawishiwi SNA in Lake County contains a 29-acre stand of early-stage, old-growth white pine (Minnesota DNR, 2001c).

Table 4 shows the total acres of timber cut in 1996 in the four coastal counties. The Superior National Forest annually produces wood for Minnesota's forest-based industries on more than 1.2 million acres available for timber harvesting (Minnesota DNR, 2001c).

Table 4. Total Timber Cut in 1996		
COUNTY	Total Acres Cut	Total Acres of Timberland
Carlton	4,001	340,500
Cook	5,182	565,400
Lake	6,756	850,100
St. Louis	38,976	2,698,800

Source: Minnesota DNR and USFS, 2000

c. Urban

In addition to population data, development activity is also indicative of growth in coastal areas. According to the NOAA report *Building Along America's Coasts, 20 Years of Building Permits, 1970-1989* (NOAA, 1992), about half of all residential and non-residential construction in the United States between 1970 and 1989 occurred in coastal areas. During this twenty year period, building permits were issued for 17,650 residential units and 2,504 non-residential units in Minnesota's 4 coastal counties. St. Louis County was the leading county with 15,361 residential and 2,294 non-residential permits issued, respectively. Roughly half of each of these 4 counties is within the Lake Superior Basin.

The principal land use features of northeastern Minnesota include the city of Duluth (with a population of 86,000), state and national forests, and park lands (Minnesota's Lake Superior CNPCP, August 2001).

Major industrial and manufacturing in the coastal area occur primarily in the Duluth-Superior metropolitan area, Wrenshall, Two Harbors, Silver Bay, Taconite Harbor, and along the St. Louis River in Cloquet. Commercial development in the coastal area is confined mainly to the Highway 61 corridor. Most commercial development that is located in the rural area is highway-orientated, service/commercial uses that cater to the traveling public and resort industry. More conventional types of commercial activity are found in the major urban communities, particularly Duluth and to a lesser degree, Cloquet, Two Harbors, Silver Bay, and Grand Marais. Such uses consist of department stores, food outlets, and offices. The majority of the North Shore residents reside within the corporate boundaries of existing communities; however, there is scattered residential development in a narrow band immediately adjacent to the shore and Highway 61 (NOAA/Minnesota DNR, 1999).

d. Marinas and Ports

The Duluth-Superior Harbor, protected by Minnesota Point, a six mile long bay mouth sand bar, covers 19 square miles of land and water that includes 17 miles of dredged channels, most with a depth of 27 feet. The Duluth-Superior Harbor is the busiest inland port in the country. The port receives more than 1,000 visits by lake carriers and oceangoing ships, which load or deliver

some 35 million tons of bulk and packaged general cargoes annually. Taconite and coal are the major domestic cargoes.

Two Harbors, population 3,650, is primarily an ore shipping and railroad center with an excellent natural harbor, Agate Bay. To the east is the second harbor, Burlington Bay, which is not commercially developed. Two Harbors is the terminus of a mining railroad from the Iron Range and of a rail spur to Duluth. The city also has several small manufacturing plants.

Minnesota ranks 4th in the United States in the number of boats registered. In 1999, there were 793,107 boats registered in Minnesota; an increase of 13,010 boats since 1996 (NMMA, 2000). Along the Lake Superior shoreline, there are 9 marinas and one harbor of refuge (Table 5), plus 11 public boat launches, a protected access at Twin points and a semi-protected access at Tofte (Minnesota's Lake Superior CNPCP, August 2001).

Table 5. Marinas and Selected Related Facilities in Minnesota's Lake Superior Basin

Name of Facility	Location	Slips	Fuel	Pu mp Out
Spirit Lake Marina/Launch	Spirit Lake Duluth	100	Yes	Yes
Waterfront Plaza Marina	Duluth Harbor Basin	12	No	No
Lakehead Boat Basin Inc.	Duluth Harbor	117	Yes	Yes
Harbor Cove Marina	Duluth Harbor Basin	108	No	No
Knife River Marina	Knife River	100	Yes	Yes
Silver Bay	Silver Bay	64	Yes	Yes
Taconite Harbor of Refuge	Taconite Harbor	0	No	No
Grand Marais Recreation Park Marina	Grand Marais Harbor	24	Yes	Yes
Grand Portage Marina	Grand Portage Bay	30	Yes	No

Source: Minnesota's Lake Superior CNPCP, August 2001

e. Fisheries

Over-fishing, the introduction of nonnative species, pollution and land use changes in the watershed have caused the Lake Superior fish community to drastically change since the mid-1900's. Since the 1950's, the fish community has become much more complex, and is now composed of both native and nonnative species. Native species include several species of lake trout, lake whitefish, brook trout, lake sturgeon and walleye, herring, chubs and sculpins. Introductions of nonnative species were both intentional and unintentional. Introduced game fish species include chinook salmon, coho salmon, pink salmon, Atlantic salmon, brown trout, rainbow (steelhead) trout, and rainbow smelt. The nonnative species increased in importance for commercial harvest and as a prey species by most game fish. Populations have since dropped and are less important today commercially or as a forage species. The most devastating introduction to the Lake Superior community has been the sea lamprey, which virtually eliminated the lake trout in all but a few isolated areas of the lake. More recently there has been a flurry of unwanted introductions from Europe that include ruffe, zebra mussel, and the spiny water flea. Since the 1960s, rehabilitation efforts, including sea lamprey control, harvest regulations and stocking programs, along with stricter pollution standards and best management practices for land use have led to partial restoration of healthy fish stocks (Minnesota's Lake Superior CNPCP, August 2001).

The commercial fishing industry has been declining in recent years. Commercial fish landings steadily decreased from 1996 to 2000. Landings decreased from 584,000 pounds in 1996 to 376,885 pounds in 1998 (NOAA, 2001). The value of the catch decreased from \$221,000 in 1996 to \$172,041 in 2000. Cisco (lake herring) were the most important commercial species. The 424,503 pounds caught were worth \$191,250 in 1998. There were 29 commercial fishing vessels operating in Minnesota in 1990.

Minnesota is first nationally in the sales of fishing licenses per capita making the recreational fishing industry of Lake Superior an important contributor to the state's economy. A total of \$1.9 billion was spent and 35 million pounds of fish were harvested in 1997 (NOAA/Minnesota DNR, 2001). Panfish, walleye, and northern pike are the most sought after recreational species. Other important recreational species include yellow perch; bluegills; crappie; channel, bullhead and flathead catfish; brook, brown, rainbow and lake trout; chinook, coho and pink salmon; large and smallmouth bass; cisco; sauger; lake whitefish; and muskellunge. Charter boat fishing is also an important economic activity concentrated on Lake Superior and focusing on the trout, salmon and walleye fisheries in the lake. - State records for 6 species of fish were caught in Cook County (Table 6).

Table 6. State Records For Recreational Fish Caught in Coastal Counties									
County	North. Pike	Coho Salmon	Chinook Salmon	Pink Salmon	Walleye	Brown Trout	Brook Trout	Rainbow Trout	Lake Trout
Cook			33 lb 4 oz	4 lb 8 oz	17 lb 8 oz		6 lb 5.6 oz	17 lb 6 oz	43 lb 8 oz
Lake	45 lb 12 oz	10 lb 7 oz							
St. Louis			33 lb 4 oz			16 lb 12 oz			

SOURCE: Minnesota DNR, 2000

f. Mining

Minnesota is the largest producer of iron ore and taconite in the United States. Even though nearly all of the high grade natural iron ore in Minnesota has already been mined, advances in technology have found a use for the lower grade iron ore, called taconite. Crushed stone, dimensional granite, iron ore and taconite, and horticultural peat are mined in St. Louis County. Dimensional granite is mined in Lake County, and crushed stone and horticultural peat are mined in Carlton County. Other potential mineral resources of the coastal counties include copper, nickel, manganese, and titanium. The most important mineral is iron ore which provided the original basis for the area's growth and has been a mainstay of the economy since the late nineteenth century. The U.S. Bureau of Mines considers the Duluth Gabbro Complex, which contains copper, nickel, and platinum group elements, as the largest known nickel sulfide resource in the country (Minnesota DNR 1997).

g. Recreation and Tourism

The Lake Superior coastal area provides excellent opportunities for outdoor recreation and tourism. The coastal area of Duluth and the North Shore are key to Minnesota's tourism and recreation industry. An estimated 3.5 million visitors came to Duluth and the North Shore in 1997 and contributed \$110 million in revenue and provided more than 11,200 jobs to the area (Kreag and Moe 1995). Sightseeing, fishing, and pleasure boating draw people in the summer while the winter season brings people for downhill and cross-country skiing, snowmobiling, ice fishing, and dog sledding.

Natural and cultural areas include 9 state parks and 6 state wayside parks, Superior National Forest, 4 regional trail systems, 6 other hiking trails, 9 snowmobile trails, 9 ski trails, 1 biking trail, 66 historical sites and structures, the Grand Portage National Monument, and hunting and fishing throughout most of the areas, and 16 Scientific and Natural Areas.

The clarity of the water of Lake Superior makes SCUBA diving a popular activity. Divers are attracted to the many shipwrecks, underwater rock formations, and shallow rock reefs along the North Shore's coast.

4. ENVIRONMENTAL CONSEQUENCES

Management measures are defined in section 6217 as economically achievable measures to control the addition of pollution to coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. As required by the statute, EPA developed guidance (USEPA, 1993) specifying management measures for the following nonpoint pollution source categories: agricultural runoff, urban runoff, forestry runoff, marinas, hydromodification, and wetlands, riparian areas, and vegetated treatment systems. Coastal nonpoint programs must provide for the implementation of management measures that are in conformity with this guidance. The guidance also lists and describes management practices that EPA has found to be representative of the types of practices that can be applied successfully to achieve the management measures. State and territory programs are not required to specify practices, but must include a process for selection of practices that will achieve the measures.

NOAA's PEIS discussed the fifty-six management measures specified in the EPA guidance and their function in preventing the environmental degradation caused by the pollutants associated with each nonpoint source category. Each coastal nonpoint program must address each of the management measures by either: (1) providing for the implementation of that measure or an alternative as effective; or (2) justifying why the management measure is not included in the program. States and territories may exclude nonpoint source categories or subcategories where the sources do not exist or do not, individually or cumulatively, present significant impacts to coastal waters.

4.A MANAGEMENT MEASURES IMPLEMENTATION

1. ENVIRONMENTAL IMPACTS

With the exceptions noted below, the Minnesota coastal nonpoint program provides for the implementation of management measures for agriculture, urban, marinas, and hydromodification nonpoint source categories, and for wetlands, riparian areas, and vegetated treatment systems. Minnesota has presented sufficient justification for exclusion of the irrigation water management measure for irrigated agricultural lands from its program. The full text of all management measures and a statement of their applicability can be found in Appendix A.

a. Agricultural Nonpoint Pollution Source Category

Although only three percent of the total acreage in the Lake Superior Basin is agricultural, the four coastal counties of Minnesota still produce a variety of commercial agricultural products and agriculture is a source of nonpoint source pollution. The Minnesota 305(b) Water Quality Assessment Report (National Water Quality Inventory, 1998) states that runoff in agriculture regions degrades water quality. With the exception of Carlton

County, nearly all the agriculturally suitable land in the coastal area is located between Duluth and Two Harbors. A few farms in Carleton County are devoted to rowcrop agriculture that is usually associated with high sediment runoff rates (Minnesota's Lake Superior CNPCP, August 2001).

The Minnesota Section 319 Nonpoint Source Management Program Plan (Minnesota Pollution Control Agency, 2001) lists agricultural cropland and pastureland as sources of sediment contributing to the impaired or threatened status of waters in the Rainy River and Lake Superior Basins.

Participants in a 1999 opinion survey of 18 staff members from 7 Minnesota State agencies about statewide major sources of groundwater contamination listed many agricultural activities as a source of contamination (Minnesota Pollution Control Agency, 1999). Pesticide and fertilizer applications, irrigation practices and animal feedlots were listed as the most important sources. The Minnesota Pollution Control Agency conducted a study to determine if ground water is impacted by different types of manure storage areas. Temporary wells were installed to determine ground water flow direction and water quality. Results showed that impacts were limited to relatively discrete plumes extending down-gradient from the storage areas and consisted of increased nitrogen, phosphorus, organic carbon, chloride, and potassium (Minnesota Pollution Control Agency, 2000).

Management measures for the following five subcategories of sources of agricultural nonpoint pollution that affect Minnesota's waters will be implemented as part of the State's coastal nonpoint program:

- o Erosion and sediment control
- o Confined animal facilities
- o The application of nutrients
- o The application of pesticides
- o Grazing management

The Environmental Consequences section of the PEIS contains a description of the primary pollutants in agricultural runoff and an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of agricultural management measures will reduce the generation of nonpoint source pollutants from agricultural activities and minimize the delivery of pollutants from agricultural lands to surface and ground waters. Agricultural management measures emphasize the control and removal of the sediment, nutrients, and pesticides entrained in runoff before they enter coastal waters. The management measures for confined animal facilities are intended to eliminate the pollutants leaving a facility by storing runoff and reducing the amount of facility wastewater and manure reaching a waterbody. The nutrient and pesticide management measures will promote a more efficient use of fertilizers and pesticides by limiting the amount of nitrogen, phosphorus, and chemicals applied to agricultural lands thereby reducing their runoff and leaching into surface and ground waters. Management measures for grazing will protect sensitive areas such as streambanks and wetlands from damage by grazing of domestic livestock. This will improve aquatic habitat.

The implementation of management measures for agricultural nonpoint pollution, based on the existing State programs and authorities discussed below, will result in broader, more widespread implementation of the management measures with the resulting environmental benefits associated with a reduction in agricultural nonpoint pollution.

Management Measures for Agricultural Sources

Given the insignificant portion of Minnesota's coastal management area subject to agricultural irrigation, NOAA and EPA propose to grant the state exemption from this management measure.

Minnesota's agricultural programs include management measures in conformity with the Section 6217(g) guidance. Minnesota has provided a legal opinion concluding that the State has authority to prevent nonpoint source pollution and require implementation of management measures, as necessary; a description of the voluntary or incentive-based programs the State will use to encourage implementation of the agricultural management measures, as necessary; a description of the mechanism or process linking the implementing agency with the enforcement agency; and a commitment to use the enforcement authority where necessary.

Minnesota intends to rely principally on the following authorities and programs for implementation of all agricultural management measures:

The State implements a broad array of incentive-based agricultural Best Management Practices (BMPs), permitting programs, and educational programs to address potential nonpoint pollution. A combination of federal, state, and local financial incentives facilitate the implementation of management measures. Minnesota has adopted appropriate permitting authorities to deal with confined areas feeding operations (CAFO), fertilizer distributors and storage facilities, and pesticide applicators. Minnesota also employs a variety of educational programs to ensure that farmers are aware of the technical assistance available and their responsibilities as stewards of the land. In the erosion and sediment control and CAFO measures, the Minnesota standards listed are for technological designs.

1. Erosion and Sediment Control Management Measure

This management measure is intended to be applied to activities that cause erosion on agricultural lands and lands converted from other uses to agricultural lands. The problems associated with soil erosion are the movement of sediment and associated pollutants by runoff into a waterbody. Application of this management measure will reduce the mass load of sediment and pollutants such as nitrogen and pesticides reaching coastal waters.

2. Management Measure for Facility Wastewater and Runoff from Confined Animal Animal Facility Management (Large and Small Units)

These management measures are intended to be applied to confined animal facilities. Application of these measures will reduce the volume of runoff, manure, and facility wastewater reaching a waterbody. The problems associated with large and small unit animal facilities are

the same. Both management measures are or will be implemented by the same state programs. The management measure reduces the amount of pollutants leaving a facility by using practices that reduce the amount of water that comes in contact with animal waste materials.

3. *Nutrient Management Measure*

This management measure is intended to be applied to activities associated with the application of nutrients to agricultural lands. The problems associated with this activity include the entrance of nutrients into ground and surface waters and the degradation of water quality. The goal is to minimize edge-of-field delivery of nutrients and the leaching of nutrients from the root zone. This measure will reduce the amount of nutrients entering both ground and surface waters and promote more efficient use of all sources of nutrients available to the producer.

4. *Pesticide Management Measure*

This management measure is intended to be applied to activities associated with the application of pesticides to agricultural lands. The problems associated with this activity are caused by the runoff and leaching of pesticides into surface and ground waters and its adverse effect on the biota and water quality. This measure will reduce contamination of surface and ground water by fostering effective and safe use of pesticides without causing environmental degradation.

5. *Grazing Management Measure*

This management measure is intended to be applied to activities on range, irrigated and nonirrigated pasture, and other grazing lands used by domestic livestock. Its focus is on the riparian zone, but this measure also encourages the control of erosion from range, pasture, and other grazing lands above the riparian zone. The problems associated with grazing are the physical disturbance of sensitive areas and the runoff of sediment, animal wastes, nutrients, and chemicals to surface waters. Application of this management measure will improve aquatic habitat by reducing the amount of pollutants entering waters through proper livestock management.

b. *Urban Nonpoint Pollution Source Category*

Most of Minnesota's Lake Superior Basin is sparsely populated with over half of the land area having a density of less than 10 people per square mile. The most recent population estimates from the U.S. Census Bureau indicate that the estimated population of the 4 counties was 248,425 (U.S. Census Bureau, 2000). The two most populated counties are Carlton and St. Louis; however, the rate of population increase is greatest in Cook County. Population is clustered in three areas: the lower St. Louis River area, including Duluth and Cloquet; the Iron Range in St. Louis County; and the North Shore of Lake Superior.

The 2000 Minnesota 305(b) Report to Congress lists urban runoff as a suspected source of pollutants to rivers in the Lake Superior Basin. Construction activities are listed as the source

of the nitrites and nitrates that are contributing to the use impairment of 7 miles of the Poplar River from Mistletoe Creek to Lake Superior. Urban runoff is listed as the source of the nitrites, nitrates and phosphorus that are contributing to the use impairment of 16 miles of the Lester River; the phosphorus and suspended solids contributing to the use impairment of 6 miles of the St. Louis River from the Pokegama River to Lake Superior, and the 5 miles from Mission Creek to the Pokegama River (Minnesota Pollution Control Agency, 2000b).

Management measures have been developed for the following six subcategories of sources of urban nonpoint pollution that affect coastal waters:

- o Runoff from developing areas
- o Runoff from construction sites
- o Runoff from existing development
- o On-site disposal systems
- o General sources (households, commercial, and landscaping)
- o Roads, highways, and bridges

The Environmental Consequences section of the PEIS contains a description of the primary pollutants in urban runoff and an analysis of the impacts on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of management measures for urban runoff will reduce the generation of nonpoint source pollutants from existing development and control runoff and treat pollutants associated with new development and redevelopment. The measures emphasize the control and removal of sediment and other suspended solids and pollutants entrained in runoff. The measures will minimize the transport of sediment and other pollutants (pesticides, fertilizers, petrochemicals, road salt, wood, garbage, paints and sealers) from new and existing development. The management measures pertaining to new and existing OSDS will reduce nutrient and pathogen loadings by: preventing the installation of conventional OSDS in areas where soil absorption systems will not provide adequate treatment of effluents; and, requiring that existing OSDS be modified, operated, repaired, and maintained to reduce pollutant loadings. The measures will require that roads, highways, and bridges are sited, constructed, operated, and maintained in order to protect sensitive ecosystems and reduce the generation and runoff of sediment, road salt, and other pollutants.

The environmental benefits that result from the implementation of management measures for urban runoff using existing Minnesota programs and authorities will be enhanced by the requirement for the State to include in its program a management measure to address new development. Increased environmental protection will result from the requirement to implement this management measure throughout the entire coastal area and to ensure that post-development total suspended solid loadings will be no greater than pre-development loadings and that control of post development hydrology will be in accordance with the management measure.

Management Measures for Urban Areas

1. New Development Management Measure

The New Development management measure is intended to be applied to control urban runoff and treat associated pollutants generated from new development, redevelopment, and new and relocated roads, highways, and bridges. The New Development Management Measure does not apply to any new development, redevelopment, and new and relocated roads, highways, and bridges occurring in urbanized areas subject to NPDES Phase I or Phase II MS4 permits. The net result of this management measure will be increased watershed protection and a reduction in the erosion, flooding, and pollutants associated with poorly planned development.

Subject to the conditions noted, Minnesota intends to rely principally on the following authorities and programs for implementation of the new development management measure:

- The Shoreland Management Act which requires the State to prepare a State water and related land resource plan.
- County-developed Water Plans. The Minnesota Board of Soil and Water Resources manages the update schedule of these water plans (typically 5-10 years effective duration).
- The requirement for Local Government Units to incorporate Best Management Practices for new development.

Conditions

Within two years Minnesota will demonstrate that all areas within the Lake Superior Basin not subject to the State Shoreland Management Act (M.S. 103F) or subject to Phase I or II of the NPDES municipal separate storm sewer systems program will implement the Section 6217(g) new development management measures via water plans or some other mechanism. Within two years the State will also demonstrate through a pilot project or further data/information sharing with NOAA/EPA that its management practices taken in combination provide for 80 percent TSS reduction by design or performance.

2. Watershed Protection and Site Development

The Watershed Protection management measure is intended to be applied to new development or redevelopment including construction of new and relocated roads, highways, and bridges that generate nonpoint source pollutants. Application of this management measure will reduce the generation of nonpoint source pollutants and mitigate the impacts of urban runoff.

The Site Development management measure is intended to be applied to all site development activities including those associated with roads, highways, and bridges. Application of this management measure will reduce the generation of nonpoint source pollution and mitigate the impacts of urban runoff through proper design and development of individual sites.

Minnesota has presented watershed protection planning efforts and site development and construction site erosion and sediment control practices in conformity with the management measures throughout the majority of the Lake Superior Basin. Minnesota has provided a legal opinion concluding that the State has authority to prevent nonpoint source pollution and require implementation of management measures, as necessary. Minnesota has included descriptions of the voluntary or incentive-based programs the State will use to encourage implementation of the urban management measures. The State has not, however, provided an acceptable description of the mechanism or process linking the implementing agency with the enforcement agency, nor demonstrated a commitment to use the enforcement authority where necessary.

Minnesota intends to rely principally on the following authorities and programs for implementation of these three management measures:

- At the watershed level, the DNR has a conservation easement program to protect riparian areas. The State Shoreland Act (M.S. 103F) requires LGUs to adopt and implement ordinances that control development density, limit development on steep slopes, limit impervious surfaces, and encourage open space.

- At the site level, the North Shore Management Plan (NSMP) is implemented along Lake Superior by LGUs. Site development must minimize soil erosion and maintain natural vegetation. Soil and Water Conservation Districts are used to provide guidance on site development and comment on state and local permits. Minn. Rules 6120 requires, in shore lands of public waters of the state, LGUs to adopt shore land management controls conforming to the North Shore Management Plan.

- The St. Louis River Management Plan, like the NSMP, is a Critical Coastal Area management plan that was developed in 1994. The management measures in the plan apply to all lands within river classification areas

- In those areas of the State not subject to the State Shorelands Act (M.S. 103F) or the North Shore Management Plan, Minnesota uses its Clean Water Partnership (CWP) Program to fund local watershed planning efforts and related development activities.

- Minnesota can ensure implementation of the Watershed Protection and Site Development management measures when LGU implementation is not complete through MDNR Waters which oversees the administration of local zoning in all shorelands and floodplains in the state. Local government units are required (MN Rules Part 6120.3900, subpart 6) to notify MDNR Waters of all public hearings to consider variances, amendments, or conditional uses under local shoreland controls at least ten days prior to the hearing.

While the legal opinion states that Minnesota has the authority to prevent nonpoint source pollution and compel the implementation of the measures, there is not adequate information on how this authority is applied, i.e., a description of the links between the voluntary or incentive-based watershed protection programs and the underlying enforcement authorities cited in the opinion, and how the state has used (or plans to use) this enforcement authority as necessary in the absence of voluntary watershed protection programs. EPA and NOAA do not find adequate assurance that the management measures will be implemented through a back-up authority if LGUs fail to adopt the measures. The State needs to describe how its programs and processes ensure implementation of preventive management measures before complaints or problems occur.

Condition

Within two years, Minnesota will demonstrate how the State ensures implementation of the watershed protection and site development measures throughout the entire 6217 management area when the LGU does not implement the management measures. Particular emphasis should be provided for those elements of the measures designed to be preventive. Within two years, Minnesota will also provide an acceptable description of the mechanism or process linking the implementing agency with the enforcement agency, and a commitment to use the existing enforcement authorities where necessary.

3. Construction Erosion and Sediment Control and Construction Site Chemical Control Management Measures

The Construction Site Erosion and Sediment Control management measure is intended to be applied to all construction activities on sites less than five acres in areas that do not have an NPDES permit in order to control erosion and sediment loss from those sites. This measure does not apply to: (1) construction of a detached single family home on a site of one-half acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. Application of this management measure will minimize the sediment being transported outside the perimeter of a construction site by reducing erosion and retaining sediment onsite.

The Construction Site Chemical Control management measure was intended to be applied to all construction sites less than five acres in area and to new, resurfaced, restored, and reconstructed road, highway, and bridge construction projects. This management measure does not apply to: (1) construction of a detached single family home on a site of one-half acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. Application of this management measure will prevent the generation of these pollutants at construction sites due to improper handling and usage, and prevent their movement from the construction site.

Subsequent to Minnesota's submission of its Coastal Nonpoint Program for approval, EPA published guidance under the NPDES Phase II program that states are not required to include the Construction Site Erosion and Sediment Control and Construction Site Chemical Control Management Measures because the NPDES storm water regulations for industrial activities on construction sites of one acre or greater apply nationwide and therefore throughout the Minnesota 6217 management area.

Although Minnesota is not required to include these management measures in its Coastal Nonpoint Program, the State has presented Construction Site Chemical Control practices in conformity with the management measures.

Minnesota intends to rely principally on the following authorities and programs for implementation of this management measure

- Minnesota National Pollutant Discharge Elimination System (NPDES) StormWater Regulations.

- Soil and Water Conservation Districts review of erosion and sediment control plans prior to issuance and the practice of using DNR hydrologists to provide technical assistance to local units of government.

4. Existing Development Management Measure

This management measure is intended to be applied to all urban areas and existing development in order to reduce surface water runoff pollutant loadings from such areas. Minnesota is not required to include the Existing Development Management Measure for any existing development within urbanized areas subject to NPDES Phase I or Phase II MS4 permits. Application of this management measure will protect or improve surface water quality by developing and implementing watershed management programs.

Minnesota's statutes and local zoning and land use ordinances are in conformity with the existing development management measure. Minnesota has also provided a legal opinion that the State has authority to prevent nonpoint source pollution and require implementation of management measures.

Minnesota intends to rely principally on the following authorities and programs for implementation of this management measure:

- Watershed management programs to reduce runoff pollutant loadings and volumes from existing developments through priority projects within a majority of the coastal management area.
- Voluntary or incentive-based programs will be used to encourage implementation of the management measure.
- The Miller Creek Watershed practices and the City of Duluth's Miller Hill Corridor Plan.
- Comprehensive watershed plans developed by State and local units of government partnerships to address (nonpoint) water quality priorities.

Condition

Within two years, Minnesota will include in its program management measures in conformity with the Section 6217(g) guidance for existing development and demonstrate how the program includes enforceable policies and mechanisms to ensure implementation throughout the 6217 management area. NOAA and EPA request that Minnesota provide, within two years, a list of retrofit opportunities in the 6217 management area and a schedule for implementing retrofits. Minnesota should also provide examples of how watershed management programs are addressing the priorities identified in the 6217 management area (through implementation of the existing development management measures).

5. New and Operating Onsite Disposal Systems Management Measures

These management measures are intended to be applied to all new and all operating Onsite Disposal Systems (OSDS) including package plants and small-scale or regional treatment facilities not covered by NPDES regulations in order to manage the siting, design, installation, and operation and maintenance of all such OSDS. Application of this management measure will prevent the installation of conventional OSDS in areas where soil absorption systems will not

provide adequate treatment of effluents containing solids, phosphorus, pathogens, and nitrogen, prior to entry into surface or ground waters. Application of this management measure will also minimize pollutant loadings from operating OSDS by requiring that they be modified, operated, repaired, and maintained to reduce nutrient and pathogen loadings in order to protect and enhance surface waters.

Minnesota has presented New and Operating OSDS enforceable policies and mechanisms in conformity with the management measures.

Minnesota intends to rely principally on the following authorities and programs for implementation of the OSDS management measures:

- Minnesota Rules Chapter 7080 establishes minimum standards and enforceable requirements for siting, installation, design, operation, and maintenance that meet the OSDS management measures. Also, county and local governments are enabled to incorporate this rule by reference and use it in enforcement activities.
- All LGUs implement an enforceable permit program for OSDS. In addition, Lake, Cook and Carlton counties have similar enforceable programs.
- Counties (except for those with local governments that have conforming ordinances) must adopt ordinances that are reviewed at the state level and comply with the state rule (7080)

6. *Pollution Prevention Management Measure*

This management measure is intended to be applied to reduce the generation of nonpoint source pollution in all areas within the section 6217 management area. It is meant to prevent and reduce pollutant loadings generated from a variety of activities within urban areas not addressed by other management measures in this source category. It is meant to ensure that communities implement solutions that may result in behavioral changes that reduce the generation of pollutants, thus reducing water quality impacts from these sources.

This management measure does not require enforceable policies. Minnesota's program includes fact sheets, technical guidance by state and local governments, household hazardous waste disposal, and recycling within counties and meets the requirements of the pollution prevention management measure.

Roads, Highways and Bridges

1. *Construction Projects and Construction Site Chemical Control*

The management measure for Construction Projects is intended to be applied to new, replaced, restored, and rehabilitated road, highway, and bridge construction projects in order to control erosion and offsite movement of sediment from such project sites. This measure emphasizes the importance of erosion and sediment control plans as effective methods in mitigating erosion problems at construction sites before any land-disturbing activity begins.

The management measure for Construction Site Chemical Control is intended to be applied to new, resurfaced, restored, and rehabilitated road, highway, and bridge construction projects in order to reduce toxic and nutrient loadings from such project sites. The objective of

this measure is to safeguard surface and ground waters from toxic spills and hazardous loadings at construction sites from equipment and fuel storage, and also from road salt, fertilizers, and pesticides stored at maintenance areas.

State coastal nonpoint pollution control programs are no longer required to include the Roads, Highways, and Bridges Construction Projects and Construction Site Chemical Control management measures because the NPDES storm water regulations for industrial activities on construction sites of one acre or greater apply nationwide and therefore throughout the 6217 management area of states and territories.

2. Planning, Siting, and Developing Roads, Highways and Bridges

The management measure for Planning, Siting, and Developing is intended to be applied to site development and land disturbing activities for new, relocated, and reconstructed roads and highways in order to reduce the generation of nonpoint source pollutants and to mitigate the impacts of urban runoff from such activities. This measure emphasizes the importance of planning to identify potential problems early in the design process.

The management measure for Bridges is intended to be applied to new, relocated, and rehabilitated bridge structures in order to control erosion, stream bed scouring, and surface runoff from such activities. This will ensure that bridges will not be sited over sensitive waters and tributaries in the coastal zone.

Minnesota's program has enforceable policies and mechanisms for these two management measures.

Minnesota intends to rely principally on the following authorities and programs for implementation of these management measures:

- Minnesota's Environmental Quality Board's guide to rules regulating Environmental Assessment, with reviews coordinated by MnDOT and county highway departments and FHWA for impacts to flood plains, wetlands, and other sensitive resources.
- Under M.S. 103F local zoning controls manage the placement and design of local public and private roads, driveways, and parking areas. Roads must meet structure setbacks and not be placed in bluff and shoreline impact zones when other reasonable and feasible placement exists.
- Minnesota DOT has also developed rules for Natural Preservation Routes based on scenic, environmental, and other characteristics. M.S.162.021 gives counties authority to adopt rules establishing minimum construction and reconstruction standards for these routes.

3. Operation and Maintenance Management Measure

The management measure for Operation and Maintenance is intended to be applied to existing, restored, and rehabilitated roads, highways, and bridges. Minnesota is not required to include the Road, Highway, and Bridge Operation and Maintenance Management Measure for any road, highway, and bridge operation and maintenance in urbanized areas subject to Phase I or Phase II NPDES MS4 permits. This measure will ensure that pollutants generated

by operation and maintenance procedures for roads, highways, and bridges, and from sparsely vegetated areas, cracked pavements, potholes, and poorly operating urban runoff control structures, are minimized through the development and implementation of a program that includes standard operating procedures and maintenance guidelines.

Minnesota's program has enforceable policies and mechanisms for this management measure.

Minnesota intends to rely principally on the following authorities and programs for implementation of the operation and maintenance management measures:

- All of the State and Local road authorities in the Lake Superior Watershed implement the many practices identified in operation and maintenance programs to reduce loading to surface waters. The State has indicated that MDNR Waters administers a Protected Waters Permit Program for all new and maintained road crossings of protected waters. The MDNR Waters General Permit for road, bridge and culvert crossings of Protected Waters requires compliance with 12 practices. The practices include activities such as exclusion dates to avoid sensitive species, hydraulic assessments, runoff systems, erosion and sediment control, site stabilization, and annual reporting of all projects. In addition, MDNR Waters Area Hydrologists coordinate annual meetings with all road authorities within the coastal area to discuss long range road projects and to address water quality and habitat concerns.

Condition

Within two years, Minnesota will demonstrate how the MDNR Protected Waters Permit Program, or another state program, ensures implementation of the practices contained within this Section 6217(g) management measure for all local roads, highways, and bridges, including roads and highways that do not cross waterbodies, outside of designated MS4 areas.

4. Runoff Systems Management Measure

The management measure for Road, Highway, and Bridge Runoff Systems is intended to be applied to existing, resurfaced, restored, and rehabilitated roads, highways, and bridges that contribute to adverse impacts to surface waters. Minnesota is not required to include the Road, Highway and Bridge Runoff System Management Measure for any road, highway and bridge runoff systems in urbanized areas subject to Phase I or Phase II MS4 permits. Surface waters will be protected through the use of runoff management systems such as vegetated filter strips, grassed swales, detention basins, constructed wetlands, and infiltration trenches.

Minnesota's program has enforceable policies and mechanisms for this management measure.

Minnesota intends to rely on the following authorities and programs for implementation of the Road, Highway, and Bridge Runoff Systems management measures:

- The "Protecting Water Quality in Urban Areas" manual list over 71 BMP's that are commonly used to reduce nonpoint source pollution from urban areas, including runoff systems. These BMP's are used alone or in combination by all road authorities to address runoff concerns.
- The State Nonpoint Source Pollution Control Plan, developed by MPCA for compliance with Section 319 of the Clean Water Act, has identified an action plan for needs, priorities and

milestones for 2001 – 2005. The 7 goals and 43 milestones (action items) identify MNDOT as one of the lead agencies for 34 of the action items

· The South St. Louis County SWCD prepared a Miller Creek Diagnostic Study and Implementation Plan that identifies short term goals (2001 – 2004) and long term (within 10 years) goals for restoring water quality standards. Working with a wide group of partners, which includes state and local road authorities, the Miller Creek Task Force will lead the implementation of several BMP's to reduce pollutant loadings from existing road runoff systems.

c. Forestry Nonpoint Pollution Source Category

Northeastern Minnesota is the most heavily forested region of the state; Cook, Lake, St. Louis and Carlton Counties are 84 percent forested. This area originally comprised many coniferous stands of eastern white pine, jack pine, red pine, white spruce, black spruce, northern white cedar, tamarack, and balsam fir. Disturbances from logging activities and fire have altered the composition of the forest, producing forests dominated by hardwoods and aspen. The Superior National Forest annually produces wood for Minnesota's forest-based industries on more than 1.2 million acres available for timber harvesting (Minnesota DNR, 2001c). There were approximately 5,000 acres of timber cut in Cook County and 4,000 acres cut in Carlton County in 1996.

The 2000 Minnesota 305(b) Report to Congress lists forestry activities as a suspected source of pollutants to rivers in the Lake Superior Basin. Nitrites and nitrates are listed as contributing to the use impairment of portions of the Cascade, Poplar and Knife Rivers. Suspended solids are also listed as contributing to the use impairment of portions of the Knife River. Nitrites and nitrates, suspended solids, and phosphorus are listed as contributing to the use impairment of portions of the St. Louis River (Minnesota Pollution Control Agency, 2000b).

Management measures have been developed for the following six subcategories of sources of forestry nonpoint pollution that affect coastal waters:

- o Road construction and use
- o Timber harvesting
- o Regeneration methods
- o Site preparation
- o Prescribed burning
- o Application of forest chemicals

The Environmental Consequences section of the PEIS contains an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of forestry management measures will reduce the runoff of pollutants to surface waters and mitigate the impacts associated with forestry activities. The forestry management measures emphasize advanced planning for forest harvesting and for locating, designing, and managing forest road systems. The management measures provide for the establishment of streamside management areas along surface waters to buffer against detrimental changes to the streams caused by sediment and loss of canopy species. The

management measures for road construction and road management will reduce erosion and runoff of sediment by minimizing the disturbance of soils and by maintaining road stability. Management measures for site preparation, forest regeneration, and revegetation of disturbed areas will help to stabilize disturbed soils, control erosion, increase rainfall infiltration, and prevent sediment and associated pollutants from entering nearby surface waters. Implementation of the forest chemical management measure will ensure that the application of fertilizers and pesticides during forestry operations will not adversely affect water quality. The management measure for wetlands forests addresses the special operating circumstances and management practices appropriate for forested wetlands in order to maintain their ability to alter floodflow, remove nutrients, and provide habitat.

Management Measures for Forestry Sources

1. *Pre-Harvest Planning Management Measure*

The management measure for preharvest planning pertains to lands where silvicultural or forestry operations are planned or conducted. The planning process components of this management measure are intended to apply to commercial harvesting on areas greater than 5 acres and any associated road system construction or reconstruction conducted as part of normal silvicultural activities. Through its advance planning process, this measure will ensure that silvicultural activities, including timber harvesting, site preparation, and associated road construction, are conducted without significant nonpoint source pollution delivery to streams and coastal areas.

2. *Streamside Management Areas (SMAs) Management Measure*

The management measure for Streamside Management Areas (SMAs) pertains to lands where silvicultural or forestry operations are planned or conducted. It is intended to apply to surface waters bordering or within the area of operations. The vegetation in SMAs will protect water quality and aquatic habitat by reducing runoff and trapping sediment and nutrients before they reach surface waters. Canopy species serve to moderate water temperatures by providing shade. They also provide the detritus for the detrital food chain, stabilize stream banks, and provide habitat for aquatic and terrestrial organisms.

3. *Road Construction/Reconstruction Management Measure*

The road construction/reconstruction management measure is intended for application on lands where silvicultural or forestry operations are planned or conducted. It applies to the clearing, pioneering, construction, and surfacing phases of road development. This management measure will reduce erosion and the runoff of sediment to surface waters by minimizing the disturbance of soil and rock during road development.

4. Road Management Management Measure

The management measure for roads pertains to lands where silvicultural or forestry operations are planned or conducted. It applies to active and inactive roads constructed or used for silvicultural activities. This management measure will protect water quality by managing existing roads to maintain stability and utility in order to minimize sedimentation and pollution from runoff-transported materials.

5. Timber Harvesting Management Measure

The management measure for timber harvest pertains to lands where silvicultural or forestry operations are planned or conducted. It is intended to apply to all harvesting, yarding, and hauling conducted as part of normal silvicultural activities on harvest units larger than 5 acres. This management measure will protect water quality by locating landings according to preharvest planning thus minimizing sedimentation resulting from the siting and harvesting of timber, and by properly managing petroleum products.

6. Site Preparation and Forest Regeneration Management Measure

The management measure for site preparation and forest regeneration pertains to lands where silvicultural or forestry operations are planned or conducted. It is intended to apply to all site preparation and regeneration activities conducted as part of normal silvicultural activities on harvested units larger than 5 acres. Regeneration of harvested forest lands provides water quality protection by stabilizing disturbed soils. Tree roots hold soil in place and aid soil aggregation, decreasing the potential for slope failure. Vegetation decreases erosion by slowing storm runoff. Maintenance of an unbroken forest litter layer prevents raindrop detachment, maintains infiltration, and slows runoff.

7. Fire Management Management Measure

The management measure for fire management pertains to lands where silvicultural or forestry operations are planned or conducted. It is intended to apply to all prescribed burning conducted as part of normal silvicultural activities on harvested units larger than 5 acres and for wildfire suppression and rehabilitation on forest lands. This management measure will minimize potential nonpoint source pollution by reducing erosion and sedimentation resulting from these operations.

8. Revegetation of Disturbed Areas Management Measure

The management measure for revegetation of disturbed areas pertains to lands where silvicultural or forestry operations are planned or conducted. It is intended to apply to all disturbed areas resulting from harvesting, road building, and site preparation conducted as part of normal silvicultural activities. Disturbed areas are those localized areas within harvest units or road systems where mineral soil is exposed or agitated (e.g., road cuts, fill slopes, landing surfaces, cable corridors, or skid trail ruts). Revegetation of disturbed areas will prevent

sediment and associated pollutants from entering nearby surface waters. Vegetation controls erosion by dissipating the erosive forces of raindrops, reducing the velocity of runoff, stabilizing soil particles, and increasing soil infiltration rates.

9. Forest Chemical Management Management Measure

The management measure for forest chemicals pertains to lands where silvicultural or forestry operations are planned or conducted. It is intended to apply to all fertilizer and pesticide applications (including biological agents) conducted as part of normal silvicultural activities. Chemicals can directly enter surface waters through five major pathways: direct application, drift, mobilization in ephemeral streams, overland flow, and leaching. Direct application is the most important pathway and is one of the most easily prevented by this management measure. Providing buffer areas around streams and waterbodies is an example of an effective method of preventing the chemicals from adversely affecting water quality.

10. Wetlands Forest Management Measure

The management measure for forested wetlands is intended for forested wetlands where silvicultural or forestry activities are planned or conducted. It is intended to apply specifically to forest management activities in forested wetlands and to supplement the previous management measures by addressing the operational circumstances and management practices appropriate for forested wetlands. This management measure will help to reduce incidental or indirect effects on forested wetlands whose beneficial functions include floodflow alteration, sediment trapping, nutrient retention and removal, and provision of habitat.

Minnesota's program has enforceable policies and mechanisms for these ten management measures.

Minnesota intends to rely principally on the following authorities and programs for implementation of these management measures:

- Minnesota has a comprehensive set of Forestry BMPs ("Forest Resources: Voluntary Site-level Forest Management Guidelines for Landowners, Loggers and Resource Professionals") and an active program to encourage their use accompanied by compliance audits and a process to respond to water quality complaints. The use of BMPs on publicly owned timberland in the coastal counties is mandatory. On federal lands, Minnesota's forest management BMPs serve as the minimum standard for operation. Timber sale contracts on State lands specify that Minnesota's forestry BMPs are to be followed.
- Encouraging the use of BMPs on Non-industrial Private Forest lands relies on voluntary programs promoted by economic incentives and public information and technical assistance.
- The "Antidegradation Policy" in MN Rule, Part 7050.0185 ; the "nuisance condition prohibition" in MN Rule, Part 7050.0210, subpart 2; and the "Public Water Resource Rule" in MN Rule, 6115 .

d. Marinas and Recreational Boating Nonpoint Pollution Source Category

Because of the extent of recreational boating activities in Minnesota, boating and marina operations are a potential source of nonpoint pollution. The 793,107 boats registered in Minnesota in 1999 ranks Minnesota 4th in the United States in the number of registered boats. Along the Lake Superior shoreline, there are 9 marinas and one harbor of refuge, plus 11 public boat launches, a protected access at Twin Points, and a semi-protected access at Tofte (Minnesota's Lake Superior CNPCP, August 2001).

The Minnesota 305(b) Water Quality Assessment Report (Minnesota EPA, 1998) does not list marinas and recreational boating as a source of pollutants contributing to the impairment of any water bodies. There are only 4 relatively large marinas, which have 100-117 boat slips each. All marinas are open to the lake, thus ensuring good flushing action. More marinas are proposed for the Lake Superior shoreline, and although Minnesota is not presently monitoring water quality at marinas, the State will begin monitoring in the near future.

Management measures have been developed for the following five subcategories of sources of nonpoint pollution from marinas and recreational boating that affect coastal waters:

- o Poorly flushed waterways where dissolved oxygen deficiencies exist,
- o Pollutants discharged from boats,
- o Pollutants transported in storm water runoff from parking lots, roofs, and other impervious surfaces,
- o The physical alteration or destruction of wetlands and of shellfish and other bottom communities during the construction of marinas, ramps, and related facilities, and
- o Pollutants generated from boat maintenance activities on land and in the water

Fifteen management measures specified for this source category are grouped under two broad headings: (1) siting and design, and (2) operation and maintenance. Effective implementation of these measures will avoid impacts associated with marina siting and prevent the introduction of nonpoint source pollutants.

The six main pollutant types associated with marina and boating activities that affect water quality include: toxicity in the water column; increased pollutant levels in aquatic organisms; increased pollutant levels in sediments; increased levels of pathogen indicators; disruption of sediment and habitat; and, shoaling and shoreline erosion. The Environmental Consequences section of the PEIS contains an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of management measures for marinas and recreational boating will reduce the runoff of pollutants to marina waters and mitigate the impacts associated with the siting and design and the operation and maintenance of new and expanding marinas. Management measures for siting and design will control stormwater runoff from marina parking lots and hull maintenance areas thereby reducing the amount of suspended solids, oil, and grease entering marina waters. The measures will protect wetlands, shellfish beds and submerged aquatic vegetation during marina construction; will provide for water quality assessments to determine whether the marina design will affect water quality; will ensure proper circulation for

flushing of the marina basin; and will reduce turbidity and shoaling by protecting against shoreline erosion. The measures for operation and maintenance emphasize the proper disposal of fish and solid wastes and the storage, transfer, containment, and disposal of sewage, oil, antifreeze, solvents, and paints. Restrictions on boating activities in shallow non-marina waters will protect shallow-water habitats and prevent resuspension of sediments and damage to submerged aquatic vegetation.

The implementation of management measures for nonpoint pollution from marinas and recreational boating, based on the existing State programs and authorities discussed below, will result in broader, more widespread implementation of the management measures with the resulting environmental benefits associated with a reduction in marina-related nonpoint pollution.

Management Measures for Marinas and Recreational Boating

Siting and Design

1. Marina Flushing Management Measure

This management measure is intended to be applied to new and expanding marinas. Initial site selection is the most important factor influencing the long-term impact a marina will have on water quality within the immediate vicinity of the marina.

2. Water Quality Assessment Management Measure

This management measure is intended to be applied to new and expanding marinas. Water quality assessments such as modeling of flushing rates, measuring water quality characteristics, and monitoring may be used to determine whether a proposed marina design will adversely affect water quality.

3. Habitat Assessment Management Measure

This management measure is intended to be applied to new and expanding marinas where site changes may impact on wetlands, shellfish beds, submerged aquatic vegetation, or other important habitats. Proper siting and design can reduce short-term impacts (habitat destruction during construction) and long-term impacts (water quality, sedimentation, circulation) on the surrounding environment.

4. Shoreline Stabilization Management Measure

This management measure is intended to be applied to new and expanding marinas where site changes may result in shoreline erosion. This measure has been shown to be effective in mitigating shoreline erosion and the resulting turbidity and shoaling.

5. Storm Water Runoff Management Measure

This management measure is intended to be applied to new and expanding marinas, and to existing marinas for at least the hull maintenance areas. Pollutants can be controlled through three techniques: filtration/infiltration; retention/detention; and, physical separation of pollutants.

6. Fueling Station Design Management Measure

This management measure is intended to be applied to new and expanding marinas where fueling stations are to be added or moved. Marinas should be located and designed and a spill contingency plan developed so that pollutants released during fueling operations can be contained in a limited area to minimize spread through and out of the marina.

7. Sewage Facility Management Measure

This management measure is intended to be applied to new and expanding marinas in areas where adequate marine sewage collection facilities do not exist. The availability and use of these systems will reduce discharges of sanitary wastes to the coastal waters.

The Minnesota program includes management measures for both siting and design and operation and maintenance in conformity with the 6217(g) guidance and includes enforceable policies and mechanisms to ensure program implementation.

Minnesota intends to rely principally on the following authorities and programs for implementation of the siting and design management measures:

- The Minnesota Environmental Protection Act and the State environmental review program. Minnesota Rules 4410.4300, Subp.25 requires an Environmental Assessment Worksheet for construction or expansion of a marina or harbor project.

- Minnesota Rules 6115 requires the DNR to issue permits for filling, excavation and structure placement in state protected waters and for any project that alters the course, current or cross-section of public waters; identifies requirements for access channels and for development of inland harbors.

- Direct State Statutory Authorities including the Outdoor Recreation Act, Shoreland Management Act, Floodplain Management Act, Protected Waters program, Water Quality Standards, and Public Waters Access Sites. Other authorities require designated local units of government to adopt shoreland, floodplain, and wild-and-scenic river zoning ordinances; require stormwater management and permits; regulate placement of above ground tanks and fueling stations, and make it unlawful to dispose of any waste into public waters.

- Marinas are required to have a National Pollutant Disposal Elimination System/State Disposal System Stormwater Permit for Industrial Activity.

- The Aboveground Storage Tank Program requires all petroleum tanks over 110 gallons to be registered.

- The MPCA requires permits for sewage facilities other than OSDS and local permits are required by LGUs for constructions of sewage facilities.

Operation and Maintenance

1. Solid Waste Management Measure

This management measure is intended to be applied to new and expanding marinas. Marina operators are responsible for determining what types of wastes will be generated at the marina and ensuring proper disposal. If adequate disposal facilities are available there is less likelihood for disposal of solid waste in surface waters or on shore where the material may wash into the waters.

2. Fish Waste Management Measure

This management measure is intended to be applied to marinas where fish waste is determined to be a source of water pollution. Marina patrons and employees are more likely to properly dispose of fish waste if told of potential environmental effects and provided adequate and convenient disposal facilities.

3. Liquid Material Management Measure

This management measure is intended to be applied to marinas where liquid materials used in the maintenance, repair, or operation of boats are stored. This measure minimizes entry of potentially harmful liquid materials into marina and surface waters through proper storage and disposal.

4. Petroleum Control Management Measure

This management measure is intended to be applied to boats that have inboard fuel tanks. The amount of fuel and oil entering marina and surface waters can be reduced by using devices such as automatic shut-off nozzles, fuel/air separators, and oil-absorbing bilge pads.

5. Boat Cleaning Management Measure

This management measure is intended to be applied to marinas where boat topsides are cleaned and marinas where hull scrubbing in the water has been shown to result in water or sediment quality problems. This measure minimizes the use and release of potentially harmful cleaners and bottom paints to marina and surface waters.

6. Public Education Management Measure

This management measure is intended to be applied to all environmental control authorities in areas where marinas are located. The best method of preventing pollution from marinas and boating activities is to educate the public about the causes and effects of pollution and methods to prevent it.

7. Maintenance of Sewage Facilities Management Measure

This management measure is intended to be applied to marinas where marine sewage disposal facilities exist. This measure is effective in preventing failure of pumpouts and discourages improper disposal of sanitary wastes thus reducing the release of untreated sewage into marina and surface waters.

8. Boat Operation Management Measure (applies to boating only)

This management measure is intended to be applied in non-marina surface waters where evidence indicates that boating activities are impacting shallow-water habitats. Boat operation in shallow water can resuspend bottom sediment, increase turbidity, and damage submerged aquatic vegetation. This management measure will minimize damage to sensitive habitats by excluding boats from shallow-water areas not suitable for boat traffic because of their ecological importance. Establishing no-wake zones will minimize the indirect impacts of increased turbidity.

Minnesota intends to rely principally on the following authorities and programs for implementation of the operation and maintenance management measures:

- State statutory or regulatory authorities make it unlawful to dispose of any wastes, including untreated sewage, into public waters; regulate hazardous waste management, storage of oil and liquid substances, and on land disposal of wastes from marine toilets; limit the amount of phosphorus allowed in cleaning products sold within the state; and govern fishing and watercraft operation.
- All motorized and non-motorized watercraft must be licensed by the DNR. A permit is required from the DNR to apply chemicals or cutting to control vegetation in public waters.

e. Hydromodification Nonpoint Pollution Source Category

There are 4 types of dams in the Lake Superior basin which were built for a variety of reasons: hydropower dams, including 5 dams on the St. Louis River in Carleton County; tailings dams, mostly by Silver Bay; lake outlet dams; and flood-control and erosion-control dams (Minnesota's Lake Superior CNPCP, August 2001). The National Inventory of Dams (NID, 2000) lists 910 dams statewide and 30 dams in the 4 coastal counties (23 in Lake County, 6 in St. Louis County, and 1 in Cook County) that meet the following section 6217(g) definition for dams.

- Constructed impoundments 25 feet or more in height and greater than 15 acre-feet in capacity, or;
- Constructed impoundments 6 feet or more in height and greater than 50 acre-feet in capacity.

In addition, there are 5 hydropower facility sites in Carleton County and 1 in Lake County (Division of Waters, 2000).

In Minnesota, it is estimated that hydromodification is the second leading source of pollutants causing impairment of fresh waters (Minnesota Pollution Control Agency, 2001). The 2000 Minnesota 305(b) Report to Congress lists hydromodification as a suspected source of pollutants to rivers in the Lake Superior Basin. Hydromodification activities are listed as the source of the nitrites, nitrates, and suspended solids that are contributing to the use impairment of 13 miles of the Knife River and 50 miles of the St. Louis River. Hydromodification activities are also listed as the source of the phosphorus that is contributing to the use impairment of 55 miles of the St. Louis River (Minnesota Pollution Control Agency, 2000b). Excessive sedimentation from stream bank erosion caused by increased peak flow conditions has required dredging operations in the Duluth-Superior Harbor and has reduced the rainbow trout population in Lake Superior (Minnesota Pollution Control Agency, 2000c).

Management measures have been developed for the following three subcategories of sources of nonpoint pollution from hydromodification activities that affect coastal waters:

- o Channelization and channel modification
- o Dams
- o Streambank and shoreline erosion

The main effects of the pollutants associated with hydromodification activities that affect water quality include: changed sediment supply, reduced availability of fresh water, accelerated delivery of pollutants, loss of surface water contact with overbank areas, loss or alteration of wetlands and instream and riparian habitats, blocked or impeded migration routes of fish, and increased sediment and nutrient levels. The Environmental Consequences section of the PEIS contains an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of management measures for hydromodification activities are intended to prevent degradation of the physical and chemical characteristics of surface waters and detrimental changes to instream and riparian habitat resulting from the transport of pollutants and from alterations in the supply of sediment and freshwater. The measures will minimize erosion, control sediment runoff, prevent downstream contamination from pesticides, petrochemicals, fertilizers, lime, cement, and construction chemicals, and protect the quality of water and aquatic habitat in reservoirs. The measures will also protect eroding streambank and shorelines that constitute a nonpoint pollution source that contributes to increased turbidity and nutrient levels in coastal waters.

The implementation of management measures for nonpoint pollution from hydromodification, based on the existing State programs and authorities discussed below, will result in broader, more widespread implementation of the management measures with the resulting environmental benefits associated with a reduction in nonpoint pollution resulting from hydromodification.

Management Measures for Hydromodification

Channelization and Channel Modification

1. Management Measure for Physical and Chemical Characteristics of Surface Waters

This management measure is intended to be applied to public and private channelization and channel modification activities in order to prevent the degradation of physical and chemical characteristics of surface waters from such activities. The purpose of this management measure is to ensure that the planning process for new hydromodification projects addresses changes to physical and chemical characteristics of surface waters that may occur as a result of the proposed work.

2. Instream and Riparian Habitat Restoration Management Measure

This management measure pertains to surface waters where channelization and channel modification have altered or have the potential to alter instream and riparian habitat such that historically present fish or wildlife are adversely affected. The purpose of this management measure is to correct or prevent detrimental changes to instream and riparian habitat from the impacts of channelization and channel modification projects.

The Minnesota program includes management measures in conformity with the 6217(g) guidance and includes enforceable policies and mechanisms to ensure program implementation.

Minnesota intends to rely principally on the following authorities and programs for implementation of the channelization and channel modification management measures:

- Any activities below the top of the bank (ordinary high water level) of any DNR Protected Water or watercourse must comply with DNR Protected Waters Permit Rules (MN Rules, Part 6115). Thus all channelization and channel modification management measures are implemented through DNR Waters Permit Rules for new projects, improvements, and maintenance projects.

- Minnesota will also use voluntary or incentive-based programs to encourage implementation of the hydromodification management measures

- The Minnesota Environmental Policy Act establishes the State's environmental review program.

Dams

1. Management Measures for Erosion and Sediment Control and Chemical and Pollutant Control

The Erosion and Sediment Control Management Measure is intended to be applied to the construction of new dams, as well as to construction activities associated with the maintenance of dams. The purpose of this measure is to prevent sediment from entering surface waters during

the construction or maintenance of dams. The purpose of this measure is to prevent sediment from entering surface waters by minimizing erosion and maximizing sediment retention onsite to reduce impacts on surface water quality.

The Chemical and Pollutant Control Management Measure is intended to be applied to the construction of new dams, as well as to construction activities associated with the maintenance of dams. The purpose of this measure is to prevent downstream contamination from pollutants such as pesticides, petrochemicals, fertilizers, lime, cement, and construction chemicals. This measure will provide for retention onsite of the soluble pollutants that are not easily controlled by erosion and sediment control practices.

Minnesota is not required to include the Erosion and Sediment Control and Chemical and Pollutant Control at Dams Management Measures because the NPDES storm water regulations for industrial activities on construction sites apply nationwide and therefore throughout the Minnesota 6217 management area.

3. Management Measure for Protection of Surface Water Quality and Instream and Riparian Habitat

This management measure is intended to be applied to dam operations that result in the loss of desirable surface water quality, and of desirable instream and riparian habitat. The purpose of this measure is to protect the quality of surface waters and aquatic habitat in reservoirs and in the downstream portions of rivers and streams that are influenced by the quality of water contained in the releases (tailwaters) from reservoir impoundments.

Minnesota intends to rely principally on the following authorities and programs for implementation of the management measures for dams:

- DNR issues a protected water permit for any project defined as a dam under state rules.
- The State's environmental review program under the Minnesota Environmental Policy Act.
- The Minnesota Environmental Rights Act allows state residents to take civil action against any person for the protection of the air, water, land or other natural resources in the state.
- Minn. Rules 6115 requires a dam safety permit, regulates water appropriations and the construction and enlargement of dams, requires DNR to make an initial systematic technical inspection of every Class I, II, and III dam, and requires dam owners to keep records and report on maintenance and perpetually maintain the dam if it is not removed.
- Local zoning authorities require site stormwater management plans for all activities within the shoreland district.
- Minnesota will also use voluntary or incentive-based programs, such as M.S. 103G which authorizes the legislature to provide funds for the repair, reconstruction, and removal of dams. M.S. 103G also controls dams and water levels in St. Louis, Cook and Lake counties.
- The Agricultural Chemicals Spills Response Program regulates storage, use and response plans for chemicals that could be used on hydromodification project sites.
- Other Direct State Statutory Authorities require cleanup of hazardous material spills; regulate the handling, storage and disposal of fertilizers; and require property owners to properly store solid wastes.

- Numerous public information and technical assistance programs improve fish habitat, acquire corridor easements on trout streams, protect riparian habitat, and collect hydraulic data.

Streambank and Shoreline Erosion

1. Management Measure for Eroding Streambanks and Shorelines

This management measure is intended to be applied to eroding shorelines in coastal bays, and to eroding streambanks in coastal rivers and creeks. This measure applies only to eroding shorelines and streambanks that constitute a nonpoint source pollution problem in surface waters. The application of vegetative or engineering stabilization techniques are effective in controlling coastal erosion. These techniques also serve to halt the destruction of wetlands and riparian areas.

Minnesota intends to rely principally on the following authorities and programs for implementation of the management measure for eroding streambanks and shorelines:

- Minnesota Rules 6115 regulates the placement of fill, including rock riprap erosion protection, the placement and design of structures and establishes and enforces no-wake zones.

- M.S. 103F requires designated LGU's to adopt shoreland, floodplain and wild and scenic zoning ordinances.

- Direct State Statutory Authorities include the authority for the Shoreland Management Act and the Protected Waters Permits. Minnesota also has "nuisance condition prohibition" in its Rules.

f. Wetlands, Riparian Areas, and Vegetated Treatment System

Statewide, about 50 percent of Minnesota's original extent of wetlands have been destroyed; however, more than 94 percent of the pre-settlement wetlands in it's Lake Superior Basin still exist. Because of this high percentage of wetlands in the basin, the effect of wetland loss on water quality is not considered a major overall contributor to nonpoint pollution; however, the loss of wetlands has had significant effects in the urban watersheds of Duluth's Miller Creek, the Duluth/Superior Harbor, and the St. Louis Estuary (Minnesota's Lake Superior CNPCP. August 2001). The loss of wetlands and the removal of vegetation causes changes to stream watersheds. This has contributed to an increase in the velocity of currents in the St. Louis River. This faster flowing water resuspends pollutant-laden sediments into the water column in the Duluth/Superior Harbor (Minnesota's Environment, 2000).

When hydrologic changes or pollutants exceed the natural assimilative capacity of wetlands and riparian areas, the systems become stressed and may be degraded or destroyed to the point that the wetlands and riparian areas themselves become sources of nonpoint pollution in coastal waters. A degraded wetland has less ability to remove pollutants and can deliver increased amounts of sediment, nutrients, and other pollutants to the adjoining waterbody.

Management measures for wetlands, riparian areas, and vegetated treatment systems address multiple categories of nonpoint source pollution that affect coastal waters, including the five

specific categories of sources previously addressed in this chapter. These measures promote the protection and restoration of wetlands and riparian areas and the use of vegetated treatment systems as means to control the nonpoint pollution emanating from such sources. Degradation of existing wetlands and riparian areas can cause the wetlands and riparian areas themselves to become sources of nonpoint pollution in coastal waters.

Management measures are provided for three categories:

- o Protection of wetlands and riparian areas
- o Restoration of wetlands and riparian areas
- o Promoting the use of vegetated treatment systems, such as constructed wetlands and vegetated filter strips

The Environmental Consequences section of the PEIS contains a discussion of the functions and importance of wetlands, riparian areas, vegetated buffers, and vegetated treatment systems.

The intent of the management measures for wetlands, riparian areas and vegetated treatment systems is to ensure that the nonpoint benefits of protecting and restoring wetlands and riparian areas, and of constructing vegetated treatment systems, will be considered in all coastal watershed water pollution control activities.

The implementation of management measures for nonpoint pollution in wetlands, riparian areas and vegetated treatment systems, based on the existing State programs and authorities discussed below, will result in broader, more widespread implementation of the management measures with the resulting environmental benefits associated with a reduction in nonpoint pollution in such areas.

Management Measures for Wetlands, Riparian Areas and Vegetated Treatment Systems

1. Management Measure for Protection of Wetlands and Riparian Areas

This management measure is intended to be applied to protect wetlands and riparian areas from adverse nonpoint source pollution impacts. The purpose is to protect the existing water quality improvement functions of wetlands and riparian areas as a component of nonpoint source programs. The overall approach is to establish a set of practices that maintains functions of wetlands and riparian areas and prevents adverse impacts to areas serving a nonpoint source pollution abatement function. These pollution abatement functions are most effective as parts of an integrated land management system that combines nutrient, sediment, and soil erosion control.

The Minnesota program includes management measures in conformity with the 6217(g) guidance and includes enforceable policies and mechanisms to ensure program implementation.

Minnesota intends to rely principally on the following authorities and programs for implementation of the management measure for protection of wetland and riparian areas:

- Minnesota uses its “Public Waters Program” (M.S. 103G), its “Wetland Conservation Act” (WCA) (Rule 8420), and its delegated authority to perform water quality certifications under

401 of the Clean Water Act. The WCA extends protection to wetlands not covered under the “public waters” statute and requires that wetlands not be drained or filled without replacement by wetlands of equal public value.

2. Management Measure for Restoration of Wetland and Riparian Areas

This management measure is intended to be applied to restore the full range of wetlands and riparian functions in areas where the systems have been degraded and destroyed and where they can serve a significant nonpoint source abatement function. This management measure should be used in conjunction with other measures addressing the adjacent land and water use in order to protect coastal water quality.

Minnesota intends to rely principally on the following authorities and programs for implementation of the management measure for restoration of wetland and riparian areas:

- The Wetland Conservation Act approval for wetland replacement plans requires that the activity impacting a wetland comply with the sequencing principles in Rule 8420. Rectifying the impact by repairing, rehabilitation, or restoring the affected wetland to ensure that all pre-project functions (including the NPS pollution abatement function) and values are restored is a high priority.
- Local government units (LGUs) have the primary responsibility for implementing the WCA. LGUs are required by the WCA to monitor replacement wetland sites for five years. Wetland mitigation sites are also protected from future alteration by a conservation easement.
- Under Enforcement (8420.0290), Cease and Desist Orders can be issued when the enforcement authority (typically DNR Conservation Officers) has probable cause that a drain, excavation, or fill activity is being or has been conducted” without appropriate approval.

3. Management Measure for Vegetated Treatment Systems

This management measure is intended to be applied in cases where engineered systems of wetlands or vegetated treatment systems can treat nonpoint source pollution. Constructed wetlands and vegetated filter strips can serve a significant nonpoint source pollution abatement function. Vegetated filter strips can improve water quality by removing nutrients, sediment, suspended solids, and pesticides. Constructed wetlands can provide limited ecological benefits in addition to their nonpoint source control functions.

Minnesota intends to rely principally on the following authorities and programs for implementation of the management measure for Vegetated Treatment Systems:

- DNR permits for activities that affect the course, current or cross-section of “Public Waters Wetlands” requires erosion control management measures. At least one LGU, Lake County, has adopted an ordinance requiring that land use permits must include measures such as constructed wetlands or engineered buffer strips to control runoff.

2. SOCIOECONOMIC IMPACTS

- a. Section 4.A.2 of the PEIS provides a summary of the economic implications of the management measures guidance as described in the Regulatory Impact Analysis prepared by

EPA (EPA, 1992c). This section also summarizes the economic achievability analyses performed for all nonpoint source categories (USEPA, 1992b; Ogg, 1992; DPRA, 1992; Research Triangle Institute, 1992a, 1992b, 1992c). These analyses provided a relative sense of the economic impacts of the management measures on affected households, municipalities, and commercial enterprises. EPA has determined from these studies that all the management measures specified in its guidance document are economically achievable.

In developing the (g) guidance document, EPA adopted a flexible approach that emphasized broad principles or standards for nonpoint source pollution control that can be applied nationally. This allows states to develop more specific programs that reflect the most cost-effective approaches in response to local conditions.

While the implementation of management measures will entail some economic costs to Minnesota, the flexibility embodied in the (g) guidance and in the NOAA/EPA Program Development and Approval Guidance, will help to reduce the economic impacts associated with implementing the coastal nonpoint program. For example, Minnesota will have until the year 2006 to fully implement the (g) management measures and until 2016 to fully implement its coastal nonpoint program, including additional management measures, where necessary. This ability to phase in program implementation over several years allows economic impacts to be absorbed over a longer time period. Another aspect of the flexibility in the program is that states may also exclude categories, subcategories, or individual nonpoint sources where the sources do not exist or do not present a threat to coastal waters. This allows states to adapt their programs to local conditions thus implementing their programs in a more cost effective manner. Based on this flexibility, Minnesota proposed, and NOAA and EPA approved, an exclusion for the irrigation water management measure for irrigated agricultural lands.

States may also adopt voluntary, education, and market-based incentive systems in addition to regulatory programs as a means of management measure implementation. Minnesota's public participation activities have and will continue to provide opportunities for public education and input regarding the coastal nonpoint program. The State's activities include forming a Programmatic Work Group to develop recommendations and action items for incorporation into the nonpoint program. Minnesota conducted a series of meetings and presentations which allowed full public view of the program planning and development process. Minnesota also provided two public review and comment periods on the program.

b. The implementation of management measures will also produce positive socioeconomic benefits for Minnesota. Implementation of the program will begin to fulfill the intent of section 6217 by helping to control sources of nonpoint pollution thus resulting in a reduction of pollution reaching coastal waters. Positive socioeconomic benefits will accrue as improvements in coastal water quality resulting from controlling nonpoint pollution increase the aesthetic value of coastal areas thereby benefitting tourism and providing enhanced opportunities for boating and swimming and other water related activities. Improvements in water quality are also likely to improve fisheries and wildlife habitat. There may be some slight and localized socioeconomic impacts from implementation of management measures and because of restrictions that may result from designation of critical coastal areas.

4.B PROGRAM IMPLEMENTATION

1. ENVIRONMENTAL IMPACTS

Section 6217 requires that state and territory coastal nonpoint programs contain a number of specific components to be used in developing and implementing their programs. These components are:

- o Coordination with Existing State Programs
- o Determination of the 6217 Management area
- o Implementation of Management Measures in Conformity with (g) Guidance
- o Identification and Implementation of Additional Management Measures
- o Technical Assistance
- o Public Participation

- o Administrative Coordination
- o Identification of Enforceable Policies and Mechanisms

The environmental consequences of these components are discussed below.

a. Coordination with Existing State Programs

The statute requires that coastal nonpoint programs be closely coordinated with state and local water quality plans and programs and with state and territory coastal zone management programs. This requirement is necessary to ensure that the new coastal nonpoint program can build upon and be integrated into existing state programs upon approval. States and territories should develop their programs to complement and strengthen existing coastal management and nonpoint source authorities. This should produce a positive environmental consequence by minimizing unnecessary duplication or conflicts at the Federal, state, or local levels. It will also fulfill what the statute and legislative history indicate is the central purpose of section 6217, i.e., to strengthen the links between Federal and state coastal zone management and water quality programs in order to enhance state and local efforts to manage land use activities that degrade coastal waters.

Minnesota's Nonpoint Source Program was developed as a joint effort of the Minnesota Department of Natural Resources (DNR) and the Minnesota Pollution Control Agency (MPCA), with assistance from the Board of Water and Soil Resources (BWSR). It was developed as part of Minnesota's Lake Superior Coastal Program (which is led by DNR) and Minnesota's Lake Superior Basin Plan.

Minnesota's control of nonpoint pollution is achieved through a combination of federal, state and local government programs and authorities. State agencies include the DNR, MPCA, BWSR, and the state departments of Agriculture, Health and Transportation. Nonpoint source pollution control at the local levels are the responsibility of the local units of government that are involved in health, highways, land use, local water planning, planning and zoning, and soil and water conservation.

b. 6217 Management Area

As directed by section 6217, NOAA, in consultation with EPA, reviewed each state's existing coastal zone boundary established under the CZMA, and made recommendations to the states on the geographic scope of their programs, i.e., the 6217 management area. This boundary recommendation, which was based on coastal watersheds, is a guide for states to use during program development. States may propose an alternative 6217 management area at the time of program submission. This proposal will then be evaluated by NOAA and EPA as part of the program review and approval process.

This provision has a positive environmental effect because it recognizes that land and water uses both within and outside of the existing coastal zone have the potential to degrade coastal waters. Evaluating coastal watersheds, whether or not those watersheds are completely encompassed within a state's existing coastal zone, ensures that all potential sources of nonpoint pollution that significantly affect coastal waters are included in the coastal nonpoint programs.

After evaluating all coastal watersheds in Minnesota for significant indicators of pollution potential, NOAA and EPA recommended to Minnesota that a 6217 management area based on watershed boundaries which is necessary "to control sources of pollution that, individually or cumulatively, significantly impact the state's coastal waters". Based on the NOAA/EPA recommendation, the Minnesota 6217 management area follows watershed boundaries and its coastal nonpoint pollution control program will therefore be implemented on a watershed basis.

c. Implementation of Management Measures in Conformity with (g) Guidance

For program approval, each coastal nonpoint program must provide for the implementation, at a minimum, of management measures in conformity with the guidance published by EPA under section 6217(g). As discussed in section 4.A, this guidance addresses five categories of nonpoint pollution: agricultural runoff, urban runoff, forestry runoff, marinas, and hydromodification. Guidance is also provided for wetlands, riparian areas, and vegetated filter strips. The environmental consequences of implementing each of these management measures is discussed above in section 4.A.1. In order to satisfy statutory requirements, state programs must identify the nonpoint source categories that will be addressed; management measures for those categories; and the process by which the state will ensure the implementation of the management measures. Each coastal nonpoint program must address each of the management measures by either implementing that measure (or an equally effective alternative), or justifying why the management measure is not included in the program.

The requirement that states implement the appropriate measures should have a positive environmental effect because the management measures are designed to reduce pollution from categories and sources of nonpoint pollution that can adversely impact a state's coastal waters. In addition, a state may include management measures for sources not identified in the 6217(g) guidance, if it determines such measures are necessary to protect coastal waters.

Minnesota requested, and NOAA and EPA approved, an exclusion for the irrigation water management measure. Minnesota has demonstrated that irrigated agricultural lands are not significant contributors of pollutants to Minnesota's coastal areas.

d. Requirements for Implementation of Additional Management Measures

For program approval, coastal nonpoint programs must provide for the implementation of additional management measures where coastal water quality is impaired or threatened even after the implementation of the management measures specified in the (g) guidance. These additional management measures are to be applied to both existing land and water uses that are found to cause or contribute to water quality impairment and to new or substantially expanding land uses within critical coastal areas adjacent to impaired or threatened coastal waters.

This requirement should have a beneficial environmental effect because it provides a second tier of protection where necessary to attain and maintain water quality standards and protect critical areas against future pollution problems.

Minnesota's program does not adequately provide for the identification of additional management measures and the continuing revision of management measures applicable to critical coastal areas and cases where (g) measures are fully implemented but water quality threats or impairments persist. Minnesota considers riparian areas along Lake Superior and streams feeding the lake the most critical coastal areas in need of protection. The State uses the North Shore Management Plan and the Shoreland Management Act to set zoning restrictions for riparian zones that specify setbacks, lot sizes and development standards. In addition, NOAA and EPA recommend that Minnesota use existing impaired waterbodies, such as those contained in the State 303(d) list of impaired waters, as the basis for targeting areas in need of additional management measures. NOAA and EPA need more detail regarding the process by which additional management measures will be developed and implemented. Therefore, NOAA and EPA are requiring the State, within two years, to provide for the identification of additional management measures and the continuing revision of management measures applicable to critical coastal areas in cases where Section 6217(g) measures are fully implemented but water quality threats or impairment persist.

e. Technical Assistance

For program approval, coastal nonpoint programs are required to provide for technical and other assistance to local governments and the public for implementing the additional management measures. States are also encouraged to provide assistance to local governments and the public for the implementation of the (g) guidance measures. Assistance may be provided in developing ordinances and regulations, technical guidance, training, financial incentives, or demonstration projects.

This requirement should be environmentally beneficial because the technical assistance will enable the management measures to be better implemented at the regional or local level. The assistance will address local needs with respect to implementation and will provide a better understanding of what the measures are trying to accomplish and how to best accomplish it. EPA has assembled a great deal of technical information during the development of its guidance document. This information will be available to the states in a variety of formats, including bibliographies and summaries, and by electronic bulletin boards.

State funding for providing technical and financial assistance is provided by M.S. 103.F705 which states that it is the purpose of the legislature to protect and improve surface water through technical and financial assistance to local government units to control water pollution. Minnesota's BWSR, the local Soil and Water Conservation Districts (SWCD) and the Natural Resources Conservation Service provide technical assistance to help landowners reduce nonpoint pollution. Technical and financial assistance is also provided by Minnesota's Lake Superior Coastal Program, the Forest Stewardship Program, Shoreland Grants, the State Revolving Fund Initiative, the Clean Water Partnership, the BWSR Challenge Grant, the Natural Resources Block Grant, SWCD Cost-share Funds, Special Project Funds, the Wildlife Habitat Improvement Program, and the Conservation Reserve Program. Minnesota, however, does not specify how technical assistance will be directed toward the implementation of additional management measures. NOAA and EPA are requiring the State, within two years, to include methods in its CNP that demonstrate how technical assistance will be provided to local governments and the public for the implementation of additional management measures.

f. Public Participation

For program approval, states must provide opportunities for public participation in all aspects of the coastal nonpoint program. Congress intended that the public be involved in the development and implementation of the program, calling not only for public participation, but also for public education.

Involving the public early in the development of the program should help improve acceptance of the program and promote and maintain the public's long-term commitment to support the goals of section 6217. Specifically providing opportunities for public comment, especially by those regulated or affected by the program, prior to program development and implementation, can ensure that the program will be accepted, and therefore more effective in controlling nonpoint pollution. The public education aspect of the requirement should be beneficial by making individuals more aware of the impact of their actions on coastal waters and by generating support for pollution control efforts at the state and local level.

Minnesota describes public participation measures that were implemented leading up to the development of both the Minnesota coastal nonpoint program and the Lake Superior Basin Plan. An extensive mail, email, Fact Sheets and a quarterly information bulletin distribution system was used to disseminate information to 2,100 individuals. A database called the "Listening Log" was used to store, organize and make use of all comments and responses. Two rounds of public meetings were held and two periods of public review of the program were held.

g. Administrative Coordination

For program approval, the coastal nonpoint program must include administrative coordination mechanisms. At a minimum, the program must include a list of state, regional and local agencies and the role that they will play in developing and implementing the program.

This requirement will be environmentally beneficial because it will help avoid conflicts and duplication of effort among the agencies involved in the coastal nonpoint program and ensure that the various agencies are fulfilling their responsibilities to implement the program. In

recognizing their specific responsibilities, agencies will be able to refine policies and procedures and maximize limited resources to more effectively support the goals of section 6217.

As discussed in section 4.B.1.a above, Minnesota's control of nonpoint pollution is achieved through a combination of federal, state and local government programs and authorities. State agencies include the Minnesota DNR MPCA, BWSR and departments of Agriculture and Health and Transportation. Nonpoint source pollution control at the local levels are the responsibility of the local units of government that are involved in health, highways, land use, local water planning, planning and zoning, and soil and water conservation.

h. Monitoring

For program approval, the coastal nonpoint program must contain a description of any necessary monitoring techniques to accompany the management measures to assess over time the success of the measures in reducing pollution loads and improving water quality. The EPA (g) guidance provides guidance for measuring changes in pollution loads and in water quality that may result from the implementation of management measures and for ensuring that the measures are implemented, inspected, and maintained properly.

This requirement should have a beneficial environmental effect because water quality monitoring is the most direct and defensible tool available to evaluate water quality and its response to management measures and other factors. By tracking management measures and water quality simultaneously, states will be able to evaluate the performance of the management measures and determine the need for additional management measures to meet water quality objectives.

Minnesota's program includes a monitoring plan. Minnesota has an extensive water quality reporting capability in the Lake Superior Basin and is formulating mechanisms to track management measure implementation for the coastal zone management program. The State also employs a Local Government Annual Reporting System in which counties and Soil and Water Conservation Districts are asked to document BMP installation.

i. Enforceable Policies and Mechanisms

For program approval, the coastal nonpoint program must contain enforceable policies and mechanisms to implement the applicable requirements of section 6217, i.e., the (g) measures and additional management measures. The term "enforceable policy" is defined in the CZMA to mean state policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a state exerts control over private and public land and water uses and natural resources in the coastal zone. Voluntary approaches, including economic incentives, may be used to implement management measures as long as they are backed by enforceable authorities.

This requirement will be environmentally beneficial because states will be able to use a variety of regulatory and/or non-regulatory approaches in order to ensure implementation of the management measures. In addition, the selection and design of enforceable policies can be tailored to specific state or local circumstances. The success of the implementation of the policies can also be enhanced through public education and technical assistance programs.

Minnesota's agricultural management measures will be implemented through a broad array of incentive-based agricultural Best Management Practices, permitting programs, and educational programs. A combination of federal, state, and local financial incentives facilitate the implementation of management measures. Minnesota has adopted appropriate permitting authorities to deal with confined areas feeding operations, fertilizer distributors and storage facilities, and pesticide applicators.

Minnesota's urban management measures will be implemented principally through the Shoreland Management Act, county-developed Water Plans, the Minnesota Board of Soil and Water Resources Local Government Units incorporated Best Management Practices for new development, the DNR conservation easement program, the North Shore Management Plan, the St. Louis River Management Plan, the Clean Water Partnership Program, and DNR Waters which oversees the administration of local zoning in all shorelands and floodplains in the state.

Management measures for marinas will be implemented principally through the Minnesota Environmental Protection Act and the State environmental review program, Minnesota Rules which require an Environmental Assessment Worksheet for construction or expansion of a marina or harbor project permits for filling, excavation and structure placement in state protected waters, direct State statutory authorities including the Outdoor Recreation Act, Shoreland Management Act, Floodplain Management Act, Protected Waters program, Water Quality Standards, and Public Waters Access Sites, the Aboveground Storage Tank Program, and MPCA-required permits for sewage facilities other than OSDS.

Management measures for hydromodification will be implemented principally through DNR's Protected Waters Permit Rules, voluntary or incentive-based programs, and the Minnesota Environmental Policy Act which establishes the State's environmental review program, the Minnesota Environmental Rights Act, Minn. Rules 6115 which requires a dam safety permit, local zoning authorities for site stormwater management plans, the Agricultural Chemicals Spills Response Program, Direct State Statutory Authorities for cleanup of hazardous materials, numerous public information and technical assistance programs, Rules 6115 which regulates the placement of fill, and LGU's shoreland, floodplain and wild and scenic zoning ordinances.

Management measures for wetlands, riparian areas, and vegetated treatment systems will be implemented principally by the Public Waters Program's Wetland Conservation Act and its delegated authority to perform water quality certifications under 401 of the Clean Water Act, the requirement under the WCA for LGUs to monitor replacement wetland sites for five years, conservation easements at wetland mitigation sites, and Cease and Desist Orders where there is probable cause that a drain, excavation, or fill activity is being or has been conducted without appropriate approval.

2. SOCIOECONOMIC IMPACTS

There should not be any significant socioeconomic impacts associated with the specific components required to be used in developing and implementing the Minnesota coastal nonpoint program. However, some impacts may result from efforts to protect and restore coastal waters.

The designation of critical coastal areas and the future implementation of additional management measures may prohibit development and certain land and water uses in some areas. Minnesota considers riparian areas along Lake Superior and streams feeding the lake the most critical coastal areas in need of protection.

Additional technical assistance may be required by local governments and the public in formulating and applying additional management measures. However, because Minnesota currently has a number of technical assistance programs, no significant additional economic impacts should result. These technical assistance programs will be used to assist municipalities and the general public with implementation of the additional management measures.

A positive impact will be attained through Minnesota's existing and on-going public participation efforts, such as the Quarterly Information Bulletin. These efforts give the public the opportunity to participate in the development of the nonpoint program and help to improve public acceptance of the program. These efforts should also lead to attitude and behavior changes as people become more aware of the environmentally beneficial goals of the coastal nonpoint program. This will produce an increased public awareness of the potential impacts of their activities on the environment and lead to less pollution and lower socioeconomic costs.

4.C ENVIRONMENTAL / SOCIOECONOMIC IMPACTS OF ALTERNATIVES

a. Approval of Minnesota Coastal Nonpoint Program

As discussed in the preceding sections, approval of the Minnesota coastal nonpoint program would have a beneficial effect on the environment because it would help to control sources of nonpoint pollution and would result in fewer pollutants reaching coastal waters. For example, the nonpoint program could help to control runoff from rural and urban areas and seepage from faulty septic systems. A problem in Minnesota is surface water impairment and degradation of aquatic habitat caused by a combination of nonpoint activities. Pollutants contributing to impairments of water quality in the waters of the Rainy River and Lake Superior Basins come from runoff of nutrients, contaminants and sediments from urban, forestry, agricultural, hydromodification and poorly protected riparian lands. The program could also help to prevent excessive erosion in the Nemadji River and thus reduce the need for dredging of sediments in the Duluth/Superior Harbor. The coastal nonpoint program would make existing programs more effective by strengthening the links between Federal and Minnesota state coastal zone management and water quality programs, thereby improving state and local efforts to manage land use activities that degrade coastal waters and habitats.

The requirement for the program to develop additional management measures, to identify critical coastal areas and coastal waters that are not attaining water quality standards, and to identify the land uses that cause or threaten those coastal waters would have a positive environmental effect by focusing attention on existing or potential problem areas that could degrade coastal waters. Minnesota's 305(b) Report, the nonpoint source assessment of surface waters, identifies and contains descriptions of the state's waterbodies that are threatened and impaired by nonpoint source pollution. A number of cooperative efforts (e.g., the Public Concerns Registration Line) are underway to prevent and mitigate nonpoint sources of pollution

to these identified areas where nonpoint pollution impacts are known to exist or threaten water quality.

The approval of the Minnesota coastal nonpoint program would also have positive socioeconomic benefits. The improvements in coastal water quality that would result from controlling nonpoint source pollution would increase the aesthetic value of coastal areas, and would benefit tourism and provide opportunities for boating and swimming and other water-related activities.

b. Conditional Approval of Minnesota Coastal Nonpoint Program

The conditional approval of the Minnesota coastal nonpoint program would have a beneficial effect on the environment because it would produce the same beneficial results as approval, provided Minnesota satisfies the conditions, and would, at least temporarily, avoid the adverse impacts of denying approval. The implementation of portions of a conditionally approved program would begin to fulfill the intent of section 6217 by helping to control sources of nonpoint pollution and will result in fewer pollutants reaching coastal waters. The same socioeconomic impacts resulting from changes in the pattern of land and water uses that are associated with approval of the Minnesota program should also result from conditional approval.

c. Deny Approval of Minnesota Coastal Nonpoint Program

The denial of approval of the Minnesota coastal nonpoint program would result in a reliance on existing programs to control nonpoint source pollution. It would result in the loss of a portion of Federal funds awarded under section 306 of the CZMA and section 319 of the CWA. This may produce adverse environmental impacts because it may cause the state not to implement management measures that are meant to control nonpoint pollution.

Minnesota's nonpoint source assessment indicates that many of the rivers and streams in Lake Superior Basins are degraded by polluted runoff and land use activities. The effects of polluted runoff can be seen in destroyed fish habitat, siltation in harbors and streams, and declining recreational use of coastal waters. Denial of this program could contribute to the continued deterioration of the state's water bodies.

The denial of approval might have an adverse economic impact because the continued degradation of water quality will affect the recreational and commercial uses and users of coastal waters. Denying approval might also cause the state not to implement a second tier of pollution control provided by additional management measures that are meant to restore degraded coastal waters and protect critical coastal areas against future pollution.

4.D UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

The conditional approval of the Minnesota coastal nonpoint pollution control program and the implementation of management measures should not produce any unavoidable adverse environmental impacts. The Minnesota coastal nonpoint program is intended to protect the environment by controlling nonpoint pollution and protecting and restoring coastal waters. There may be some changes in the patterns of land and water uses in order to avoid activities

that degrade coastal waters and habitats. These changes in activities, such as directing development away from critical coastal areas, should not result in any unavoidable adverse environmental impacts. In addition, section 6217(g) requires a description of any necessary monitoring techniques to accompany the management measures to assess over time the success of the measures in reducing pollution loads and improving water quality. The Minnesota program addresses these required monitoring techniques in Chapter III-E of the program.

4.E RELATIONSHIP BETWEEN SHORT-TERM USES OF ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The overall purpose of section 6217 and the Minnesota coastal nonpoint control program is to protect and restore coastal waters and thus to enhance the long-term productivity of all coastal resources. The NOAA/EPA review of the Minnesota program and preparation of this environmental assessment have not indicated that the Minnesota program includes any short-term uses of the environment which would degrade long-term productivity. Some short-term uses of the environment may have to be modified in response to implementation of management measures. This may result in short-term costs to the users, but will result in long-term benefits to the environment through cleaner coastal waters, protected resources, and increased productivity.

4.F IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NOAA does not anticipate any irreversible or irretrievable commitment of resources as a result of the approval of the Minnesota coastal nonpoint program. However, the section 6217 requirements for states and territories to establish a 6217 management area, to implement management measures in this area, and to identify and map critical coastal areas that need additional measures to protect them against present and future nonpoint pollution problems, may have the effect of reallocating resources for an indefinite period of time. The identification of critical areas may also have the effect of restricting development or other activities in the critical areas and concentrating these activities in other locations. Although development activity results in the affected site being committed to the new use for an indefinite period of time, and can practically be considered an irretrievable commitment of resources, the amount of resources is expected to be minimal. Also, although critical areas may need special controls such as setbacks and low density zoning to protect coastal waters, these designations may change in the future.

5. LIST OF PREPARERS

Joseph P. Flanagan - Environmental Protection Specialist, Coastal Programs Division in the Office of Ocean and Coastal Resource Management, had lead responsibility for the preparation of the Minnesota environmental assessment. He has been involved in the preparation of environmental impact statements and assessments since 1980 in NOAA's Ocean Minerals and Energy Division, Marine Sanctuaries Division, and Coastal Programs Division. He has a B.S. in Geology/Chemistry from the University of Miami and an M.S. in Environmental Systems Management from The American University.

6. LIST OF AGENCIES AND PERSONS CONSULTED

The following Federal and Minnesota agencies were consulted during the preparation of the environmental assessment and during the review of the Minnesota coastal nonpoint program. These agencies also received a copy of the environmental assessment.

Federal Agencies

Department of Commerce
National Marine Fisheries Service
National Ocean Service
Department of the Interior
U.S. Fish and Wildlife Service
Environmental Protection Agency
Office of Wetlands, Oceans and Watersheds
Region V - Nonpoint Source Coordinator

Minnesota Agencies

Minnesota Department of Natural Resources
Minnesota Pollution Control Agency

7. FINDING OF NO SIGNIFICANT ENVIRONMENTAL IMPACT

NOAA Administrative Order (NAO) 216-6 (revised May 20, 1999) provides eleven criteria for determining the significance of the impacts of a proposed action. These criteria are discussed below with respect to the proposed action (alternative 2.B):

1. Impacts may be both beneficial and adverse—a significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

NOAA does not expect there to be any significant adverse effects from the proposed action, although some minor socioeconomic may result from Minnesota's efforts to protect and restore coastal waters through implementation of its Coastal Nonpoint Program (CNP). The designation of critical coastal areas and future implementation of additional management measures may prohibit development and certain land and water uses in some areas. Beneficial effects on the

human environment will result from implementing the program, which will help control sources on nonpoint pollution, resulting in fewer pollutants reaching coastal waters.

2. What is the degree to which public health or safety is affected by the proposed action.

Public health and safety will be positively affected by the proposed action. Minnesota's nonpoint source assessment (Section 305[b] report) indicates that many of the rivers and streams in Lake Superior Basins are degraded by polluted runoff and land use activities. The effects of the polluted runoff can be seen in destroyed fish habitat, siltation in harbors and streams, and declining recreational use of coastal waters. Implementation of the CNP management measures will result in reduced runoff from rural and urban areas and seepage from faulty septic systems, thereby improving coastal water quality. The program could also help to prevent excessive erosion in the Nemadji River and thus reduce the need for dredging of sediments in the Duluth/Superior Harbor.

3. Are there unique characteristics of the geographic area in which the proposed action is to take place?

The proposed action will be implemented in Minnesota's section 6217 management area, which follow's the state's watershed boundaries. There may be unique characteristics within this geographic area, however, they are not, and will not be, targeted by the proposed action.

4. What is the degree to which effects on the human environment are likely to be highly controversial?

The effects to the human environment are expected to be primarily positive, resulting in the improvement of the State's coastal water quality. The majority of the program will be implemented through Minnesota's existing state laws, regulations, permit programs, voluntary programs, and education and outreach activities, and therefore controversy is extremely unlikely. In some cases, the State may be required to carry out enforcement activities, including preventive actions to reduce the threat of nonpoint source pollution occurring. However, as a condition of full programmatic approval, the State will provide NOAA with a legal opinion that the State already has the authority to pursue this approach to reducing nonpoint source pollution. Therefore, it is unlikely that controversy will be experienced in these events as well.

5. What is the degree to which effects are highly uncertain or involve unique or unknown risks?

NOAA worked with the U.S. Environmental Protection Agency to identify 62 management measures (best management practices, or BMPs) that have been field-tested, and demonstrated to reduce nonpoint source pollution when implemented with only beneficial impacts for the environment. In order to receive conditional program approval, Minnesota had to demonstrate that it either had in place, or had the ability to require implementation of these same management measures. In addition, the State was required to establish a monitoring program to determine if the management measures were sufficiently effective in achieving coastal nonpoint pollution

goals, or if additional management measures should be put in place. Therefore, NOAA is highly certain that there are no unique or unknown risks associated with the effects from the proposed action.

6. What is the degree to which the action establishes a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

NOAA has already conditionally approved 31 state coastal nonpoint pollution control programs, and fully approved 11 of these programs where the conditions have been addressed. Therefore, this action does not set a precedent. Furthermore, Minnesota's monitoring program required for program approval will answer some outstanding questions about the effects of the implementation of the section 6217 management measures on water quality and will allow the state to make more informed decisions about applying additional management measures to meet water quality standards and protect designated uses.

7. Does the proposed action have individually insignificant but cumulatively significant impacts?

The proposed action is expected to have individually insignificant impacts. The cumulative impacts of applying the section 6217 management measures throughout Minnesota's section 6217 management area are likely to be diffuse, and cumulatively insignificant, based on the incremental approach of implementation, monitoring, and seeking additional management measures to meet, rather than exceed designated water quality standards and protect prescribed uses. In many situations, the proposed management measures are already being applied through existing programs, and approval of this program is only resulting in codification, or official approval of the State's current set of procedures for addressing nonpoint source pollution.

8. What is the degree to which the action adversely affects entities listed in or eligible for listing in the National Register of Historic Places, or may cause loss or destruction of significant scientific, cultural, or historic resources.?

The proposed action will not adversely affect any entity listed in or eligible for listing in the National Register of Historic Places. Nor will the proposed action cause the loss of or destroy any significant scientific, cultural, or historic resources. The section 6217 management measures are generally restricted to addressing nonpoint source runoff issues related to the following activities: agriculture, forestry, urban development (permeable surfaces, erosion, etc.), marinas, hydromodification, and wetlands. If any of these activities were to occur on historic, significant scientific, or cultural places, it is most likely that management measures would be implemented only in a way that would add to their preservation.

9. What is the degree to which endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973, are adversely affected?

For the most part, the 6217 management measures are non-structural in nature, and their overall purpose is to protect and restore coastal waters and thus enhance the long-term productivity of all coastal resources. If proposed actions do occur within any habitat that has been designated as critical for the survival of any endangered or threatened species, it will be in response to, or related to a permitted activity, which will have to have taken into consideration endangered and threatened species. There may be some changes in the patterns of land and water uses in order to avoid activities that degrade coastal waters and habitats. These changes in activities, such as directing development away from critical coastal areas, should not result in any adverse effects to threatened and endangered species.

10. Is a violation of Federal, state, or local law for environmental protection threatened?

No. The proposed action, implementation of section 6217 management measures, is actually the implementation of state and local laws, regulations, and programs, that are consistent with the federal program requirements.

11. Will the proposed action result in the introduction or spread of a nonindigenous species?

All of the management measure implementation activities will be confined to the areas impacted by the various categories of nonpoint source pollution, within Minnesota's coastal nonpoint control area. None of the activities will involve the importation or use of items that would contain nonindigenous species. Therefore, the risk of the introduction or spread of a nonindigenous species is nonexistent.

FONSI STATEMENT

In view of the analysis presented in this document, the proposed implementation Minnesota's Coastal Nonpoint Pollution Control Program will not significantly affect the quality of the human environment, with specific reference to the criteria contained in Section 6.01 of NAO 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act (NEPA). Accordingly, the preparation of an Environmental Impact Statement for the proposed action is not necessary.

Alan Neuschatz
Associate Assistant Administrator for Management
Oceans Services and Coastal Zone Management
National Oceanic and Atmospheric Administration

Date

8. REFERENCES

- Census of Agriculture, 1997. (www.nass.usda.gov/census/census97/volum1)
- Coast Alliance. 1995. *The State of the Coasts - A State-by-State Analysis of the Vital Link Between Healthy Coasts and a Healthy Economy*. Washington, D.C., June 1995.
- Division of Waters. 2000. Minnesota Department of natural Resources (www.dnr.state.mn.us/waters/surfacection/stream_hydro/hydropower_sites.html)
- DPRA. 1992. *Economic Impact Analysis of Coastal Zone Management Measures Affecting Confined Animal Facilities*. Prepared by DPRA, Inc. for U.S. Environmental Protection Agency, Washington, D.C.
- Minnesota's Agriculture, 1999. (www.mda.state.mn.us/maitc/agprofile.pdf)
- Minnesota DNR, 2001a. USGS River Kilometer Index and MNDOT Basemap surface hydrology project. (www.dnr.state.mn.us/waters/wetlands/wetfacts.html)
- Minnesota DNR, 2001b. Data from National Wetland Inventory. (www.dnr.state.mn.us/waters/wetlands/wetfacts.html)
- Minnesota DNR. 2001c. Ecological Services: A Guide to Scientific and Natural Areas. (www.dnr.state.mn.us/ecological_services/sna/guide/coniferous_landscape.html)
- Minnesota DNR/USFS. 2000. Forest Inventory and Analysis Database Retrieval System. (<http://srsfia.usfs.msstate.edu/scripts/ew.htm>)
- Minnesota Environment 2000. Minnesota Pollution Control Agency, Department of Natural Resources. (www.pca.state.mn.us/about/pubs/mnreport)
- Minnesota's Lake Superior CNPCP. August 2001. *Coastal Nonpoint Pollution Control Program*. Minnesota Pollution Control Agency, Department of Natural Resources.
- Minnesota Pollution Control Agency. 2001. Minnesota 2001-2005 Nonpoint Source Management Program Plan - Summary of Agricultural Sediment Sources for Selected Impacted Waters.
- Minnesota Pollution Control Agency. 2000a. *Ground Water Quality Adjacent to Animal Feedlots*. Minnesota Department of Natural Resources.
- Minnesota Pollution Control Agency. 2000b. *2000 Minnesota Water Quality: Surface Water Quality Section - Report to the Congress, Water Years 1998-99*. Minnesota Department of Natural Resources.

- Minnesota Pollution Control Agency. 2000c. *The Annual Minnesota Nonpoint Source Pollution Management Report - 2000*. Minnesota Department of Natural Resources.
- Minnesota Pollution Control Agency. 1999. *Major Sources of Ground Water Contamination*. (www.pca.state.mn.us/water/groundwater/gwcontamination.html)
- NASS. 1997. National Agricultural Statistics Service. 1997 Census of Agriculture. (<http://www.nass.usda.gov/census/census97/rankings/ac97s-3r.pdf>)
- National Water Quality Inventory, 1998. Report to Congress. (www.epa.gov/305b/98report/mn/html)
- NID. 2000. National Inventory of Dams. U.S. Army Corps of Engineers. ([Http://crunch.tec.army.mil/nid/webpages/nidresults](http://crunch.tec.army.mil/nid/webpages/nidresults))
- NMMA. 2000. *Boating Statistics*. National Marine Manufacturers Association. Chicago. IL. On-line at www.nmma.org/facts/boatinf.
- NOAA, 2001. National Marine Fisheries Service, NOAA. Silver Spring, MD. (www.st.nmfs.gov/st1)
- NOAA. 1996. *Coastal Nonpoint Pollution Control Program Final Programmatic Environmental Impact Statement*. National Oceanic and Atmospheric Administration.
- NOAA. 1992. *Building Along America's Coasts, 20 Years of Building Permits, 1970-1989*. National Oceanic and Atmospheric Administration.
- NOAA/EPA. 1993. *Coastal Nonpoint Pollution Control Program, Program Development and Approval Guidance*. National Oceanic and Atmospheric Administration and Environmental Protection Agency. January 1993.
- NOAA/Minnesota DNR. 1999. *Combined Coastal Management Program and Final Environmental Impact Statement for the State of Minnesota*. National Oceanic and Atmospheric Administration and Minnesota Department of Natural Resources. 1997.
- NOAA/Minnesota DNR. 2001. (www.dnr.state.mn.us/fish_and_wildlife/fish_facts.html)
- Ogg, C., 1992. *Economic Achievability of Two Management Measures for Managing Fertilizer Nutrients*. U.S. Environmental Protection Agency, Office of Policy Analysis, Washington, D.C.

- Research Triangle Institute. 1992a. *Economic Analysis of Coastal Nonpoint Source Pollution Controls: Forestry*. Prepared by Research Triangle Institute for U.S. Environmental Protection Agency, Washington, D.C.
- Research Triangle Institute. 1992b. *Economic Analysis of Coastal Nonpoint Source Pollution Controls: Urban Areas, Hydromodification, and Wetlands*. Prepared by Research Triangle Institute for U.S. Environmental Protection Agency, Washington, D.C.
- Research Triangle Institute. 1992c. *Economic Analysis of Coastal Nonpoint Source Pollution Controls: Marinas*. Prepared by Research Triangle Institute for U.S. Environmental Protection Agency, Washington, D.C.
- University of Minnesota. 2000a. River Basins of Minnesota, Department of Soil, Water, and Climate. (<http://soils.agri.umn.edu/research/arrow/doc/agecdata.html>)
- University of Minnesota. 2000b. River Basins of Minnesota, Department of Soil, Water, and Climate. (<http://soils.umn.edu/research/rivers/minnesota>)
- U.S. Census Bureau. 2000. County Population Estimates for July 1, 1999. (www.census.gov/population/estimates/county/co-99-1/99C1_39.txt)
- USEPA. 1993. *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. Office of Water, U.S. Environmental Protection Agency, Washington, D.C.
- USEPA. 1992b. *Economic Achievability Analysis - Agricultural Management Measures*. Office of Policy Analysis, U.S. Environmental Protection Agency, Washington, D.C.
- USEPA. 1992c. *Regulatory Impact Analysis: Management Measures Guidance for Nonpoint Source Controls in Coastal Watershed Areas*. Prepared by RCG/Hagler, Bailly, Inc. for Office of Water, U.S. Environmental Protection Agency, Washington, D.C.

9. APPENDIX A. MANAGEMENT MEASURES FOR SOURCES OF NONPOINT POLLUTION IN COASTAL WATERS

1. Management Measures for Agricultural Sources

1. Erosion and Sediment Control Management Measure

Apply the erosion component of a Conservation Management System (CMS) as defined in the Field Office Technical Guide of the U.S. Department of Agriculture Natural Resources Conservation Service to minimize the delivery of sediment from agricultural lands to surface waters, or

Design and install a combination of management and physical practices to settle the settleable solids and associated pollutants in runoff delivery from the contributing area for storms of up to and including a 10-year, 24-hour frequency.

2a. Management Measure for Facility Wastewater and Runoff from Confined Animal Facility Management (Large Units).

Limit the discharge from the confined animal facility to surface waters by:

(1) Storing both the facility wastewater and the runoff from confined animal facilities that is caused by storms up to and including a 25-year, 24-hour frequency storm.

Storage structures should:

(a) Have an earthen lining or plastic membrane lining, or

(b) Be constructed with concrete, or

(c) Be a storage tank; and

(2) Managing stored runoff and accumulated solids from the facility through an appropriate waste utilization system.

This management measure is intended to be applied to all new facilities regardless of size and to all new or existing confined animal facilities that contain the following number of head or more:

	<u>Head</u>	<u>Animal Units</u>
Beef Feedlots	300	300
Stables (horses)	200	400
Dairies	70	98
Layers	15,000	150 ¹ 495 ²
Broilers	15,000	150 ¹ 495 ²
Turkeys	13,750	2,475
Swine	200	80

This measure does not apply to those facilities that are defined as concentrated animal feeding operations by Federal regulation 40 CFR 122 and are required to obtain NPDES discharge permits. This regulation allows the Director of a NPDES discharge program to designate any animal feeding operation as a concentrated animal feeding operation (thus subjecting the operation to NPDES program requirements) upon determining that it is a significant contributor of pollution. If an NPDES permit is issued, the terms of the permit apply and this management measure is not required.

A confined animal facility is a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

- Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and
- Crops, vegetation forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

2b. Management Measure for Facility Wastewater and Runoff from Confined Animal Facility Management (Small Units)

Design and implement systems that collect solids, reduce contaminant concentrations,

and reduce runoff to minimize the discharge of contaminants in both facility wastewater and in runoff that is caused by storms up to and including a 25-year, 24-hour frequency storm. Implement these systems to substantially reduce significant increases in pollutant loadings to ground water. Manage stored runoff and accumulated solids from the facility through an appropriate waste utilization system.

This management measure is intended to be applied to all existing confined animal facilities that contain the following number of head:

	<u>Head</u>	<u>Animal Units</u>
Beef Feedlots	50-299	50-299 1b
Stables (horses)	100-199	200-399
Dairies	20-69	28-97
Layers	5000-14,999	50-149 ³
		165-494 ⁴
Broilers	5,000-14,999	50-149 ³
		165-494 ⁴
Turkeys	5,000-13,749	900-2,474
Swine	100-199	40-79

³ If facility has a liquid manure system, as used in 40 CFR Section 122, App.B.

⁴ If facility has continuous overflow watering, as used in 40 CFR Section 122, App.B.

This measure is subject to the same NPDES designation criteria mentioned for large unit animal facilities. Facilities containing fewer than the number of head listed above are not subject to this management measure. Existing facilities that meet the requirements of management measures for large units are in compliance with the requirements of this measure. Existing and new facilities that already minimize the discharge of contaminants to surface waters, protect against contamination of ground water, and have an appropriate waste utilization system may already meet the requirements of this measure. Such facilities may not need additional controls for the purposes of this measure.

3. Nutrient Management Measure

Develop, implement, and periodically update a nutrient management plan to:

(1) apply nutrients at rates necessary to achieve realistic crop yields, (2) improve the timing of nutrient application, and (3) use agronomic crop production technology to increase nutrient use efficiency. When the source of the nutrients is other than commercial fertilizer, determine the nutrient value and the rate of availability of the nutrients. Determine and credit the nitrogen contribution of any legume crop. Soil and plant tissue testing should be used routinely.

Nutrient management plans contain the following core components:

(1) Farm and field maps showing acreage, crops, soils, and waterbodies.

(2) Realistic yield expectations for the crop(s) to be grown, based primarily on the producer's actual yield history, State Land Grant University yield expectations for the soil series, or SCS Soils-5 information for the soil series.

(3) A summary of the nutrient resources available to the producer, which at a minimum include:

- Soil test results for pH, phosphorus, nitrogen, and potassium;*
- Nutrient analysis of manure, sludge, mortality compost or effluent;*
- Nitrogen contributions to the soil from legumes grown in the rotation;*
- Other significant nutrient sources (e.g., irrigation water).*

(4) An evaluation of field limitations based on environmental hazards or concerns, such as,

- Sinkholes, shallow soils over fractured bedrock, and soils with high leaching potential,*
- Lands near surface water,*
- Highly erodible soils, and,*
- Shallow aquifers.*

(5) Use of the limiting nutrient concept to establish the mix of nutrient sources and requirements for the crop based on a realistic yield expectation.

(6) Identification of timing and application methods for nutrients to: provide nutrients at rates necessary to achieve realistic crop yields; reduce losses to the environment; and avoid applications

as much as possible to frozen soil and during periods of leaching and runoff.

(7) Provisions for the proper calibration and operation of nutrient application equipment.

4. Pesticide Management Measure

To reduce contamination of surface water and ground water from pesticides:

- (1) Evaluate the pest problems, previous pest control measures, and cropping history;
- (2) Evaluate the soil and physical characteristics of the site including mixing, loading, and storage areas for potential leaching or runoff of pesticides. If leaching or runoff is found to occur, steps should be taken to prevent further contamination;
- (3) Use integrated pest management (IPM) strategies that:
 - (a) Apply pesticides only when an economic benefit to the producer will be achieved (i.e., applications based on economic thresholds); and
 - (b) Apply pesticides efficiently and at times when runoff are unlikely;
- (4) When pesticide applications are necessary and a choice of registered materials exists, consider the persistence, toxicity, runoff potential, and leaching potential of products in making a selection;
- (5) Periodically calibrate pesticide spray equipment; and
- (6) Use anti-backflow devices on hoses used for filling tank mixtures.

5. Grazing Management Measure

Protect range, pasture and other grazing lands:

- (1) By implementing one or more of the following to protect sensitive areas (such as streambanks, wetlands, estuaries, ponds, lake shores, and riparian zones):
 - (a) Exclude livestock,
 - (b) Provide stream crossings or hardened watering access for drinking,
 - (c) Provide alternative drinking water locations,
 - (d) Locate salt and additional shade, if needed, away from sensitive areas, or
 - (e) Use improved grazing management (e.g., herding) to reduce the physical disturbance and reduce direct loading of animal waste and sediment caused by livestock; and
- (2) By achieving either of the following on all range, pasture, and other grazing lands not addressed under (1):
 - (a) Implement the range and pasture components of a Conservation Management System (CMS) as defined in the Field Office Technical Guide of the USDA-SCS by applying the progressive planning approach of the USDA Soil Conservation Service (SCS) to reduce erosion, or
 - (b) Maintain range, pasture, and other grazing lands in accordance with activity plans established by either the Bureau of Land Management of the U.S. Department of the Interior or the Forest Service of the USDA.

6. Irrigation Water Management

To reduce nonpoint source pollution of surface waters caused by irrigation:

- (1) Operate the irrigation system so that the timing and amount of irrigation water applied match crop water needs. This will require, as a minimum: (a) the accurate measurement of soil-water depletion volume and the volume of irrigation water applied, and (b) uniform application of water.
- (2) When chemigation is used, include backflow preventers for wells, minimize the harmful amounts of chemigated waters that discharge from the edge of the field, and control deep percolation. In cases where chemigation is performed with furrow irrigation systems, a tailwater management system may be needed.

The following limitations and special considerations apply:

- (1) In some locations, irrigation return flows are subject to other water rights or are required to maintain stream flow. In these special cases, on-site reuse could be precluded and would not be considered part of the management measure for such locations.
- (2) By increasing the water use efficiency, the discharge volume from the system will usually be reduced. While the total pollutant load may be reduced somewhat, there is the potential for an increase in the concentration of pollutants in the discharge. In these special cases, where living resources or human health may be adversely affected and where other management measures (nutrients and pesticides) do not reduce concentrations in the discharge, increasing water use efficiency would not be considered part of the management measure.
- (3) In some irrigation districts, the time interval between the order for and the

delivery of irrigation water to the farm may limit the irrigator's ability to achieve the maximum on-farm application efficiencies that are otherwise possible.

(4) In some locations, leaching is necessary to control salt in the soil profile.

Leaching for salt control should be limited to the leaching requirement for the root zone.

(5) Where leakage from delivery systems or return flows supports wetlands or wildlife refuges, it may be preferable to modify the system to achieve a high level of efficiency and then divert the "saved water" to the wetland or wildlife refuge. This will improve the quality of water delivered to wetlands or wildlife refuges by preventing the introduction of pollutants from irrigated lands to such diverted water.

(6) In some locations, sprinkler irrigation is used for frost or freeze protection, or for crop cooling. In these special cases, applications should be limited to the amount necessary for crop protection, and applied water should remain on-site.

2. Management Measures for Urban Areas

1. New Development Management Measure

(1) By design or performance:

(a) After construction has been completed and the site is permanently stabilized, reduce the average annual total suspended solid (TSS) loadings by 80 percent.

For the purposes of this measure, an 80 percent TSS reduction is to be determined on an average annual basis, or*

(b) Reduce the postdevelopment loadings of TSS so that the average annual TSS loadings are no greater than predevelopment loadings, and

(2) To the extent practicable, maintain postdevelopment peak runoff rate and average volume at levels that are similar to predevelopment levels.

Sound watershed management requires that both structural and nonstructural measures be employed to mitigate the adverse impacts of storm water.

Nonstructural Management Measures 11.B and 11.C can be effectively used in conjunction with Management Measure 11.A to reduce both the short-and long-term costs of meeting the treatment goals of this management measure.

** Based on the average annual TSS loadings from all storms less than or equal to the 2-year/24 hour storm. TSS loadings from storms greater than the 2-year/24 hour storm are not expected to be included in the calculation of the average annual TSS loadings.*

2. Watershed Protection Management Measure

Develop a watershed protection program to:

(1) Avoid conversion, to the extent practicable, of areas that are particularly susceptible to erosion and sediment loss;

(2) Preserve areas that provide important water quality benefits and/or are necessary to maintain riparian and aquatic biota; and

(3) Site development, including roads, highways, and bridges, to protect to the extent practicable the natural integrity of waterbodies and natural drainage systems

3. Site Development Management Measure

Plan, design, and develop sites to:

(1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss;

(2) Limit increases of impervious areas, except where necessary;

(3) Limit land disturbance activities such as clearing and grading, and cut and fill to reduce erosion and sediment loss; and

(4) Limit disturbance of natural drainage features and vegetation.

4. Construction Site Erosion and Sediment Control Management Measure

(1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction, and

(2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

5. Construction Site Chemical Control Management Measure

- (1) Limit application, generation, and migration of toxic substances;*
- (2) Ensure the proper storage and disposal of toxic materials; and*
- (3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.*

6. Existing Development Management Measure

Develop and implement watershed management programs to reduce runoff pollutant concentrations and volumes from existing development:

- (1) Identify priority local and/or regional watershed pollutant reduction opportunities, e.g., improvements to existing urban runoff control structures;*
- (2) Contain a schedule for implementing appropriate controls;*
- (3) Limit destruction of natural conveyance systems; and*
- (4) Where appropriate, preserve, enhance, or establish buffers along surface waterbodies and their tributaries.*

7. New Onsite Disposal Systems Management Measures

- (1) Ensure that new Onsite Disposal Systems (OSDS) are located, designed, installed, operated, inspected, and maintained to prevent the discharge of pollutants to the surface of the ground and to the extent practicable reduce the discharge of pollutants into ground waters that are closely hydrologically connected to surface waters. Where necessary to meet these objectives: (a) discourage the installation of garbage disposals to reduce hydraulic and nutrient loadings; and (b) where low-volume plumbing fixtures have not been installed in new developments or redevelopments, reduce total hydraulic loadings to the OSDS by 25 percent. Implement OSDS inspection schedules for preconstruction, construction, and postconstruction.*
- (2) Direct placement of OSDS away from unsuitable areas. Where OSDS placement in unsuitable areas is not practicable, ensure that the OSDS is designed or sited at a density so as not to adversely affect surface waters or ground water that is closely hydrologically connected to surface water. Unsuitable areas include, but are not limited to, areas with poorly or excessively drained soils; areas with shallow water tables or areas with high seasonal water tables; areas overlaying fractured bedrock that drain directly to ground water; areas with floodplains; or areas where nutrient and/or pathogen concentrations in the effluent cannot be sufficiently treated or reduced before the effluent reaches sensitive waterbodies;*
- (3) Establish protective setbacks from surface waters, wetlands, and floodplains for conventional as well as alternative OSDS. The lateral setbacks should be based on soil type, slope, hydrologic factors, and type of OSDS. Where uniform protective setbacks cannot be achieved, site development with OSDS so as not to adversely affect waterbodies and/or contribute to a public health nuisance.*
- (4) Establish protective separation distances between OSDS system components and groundwater which is closely hydrologically connected to surface waters. The separation distances should be based on soil type, distance to ground water, hydrologic factors, and type of OSDS;*
- (5) Where conditions indicate that nitrogen-limited surface waters may be adversely affected by excess nitrogen loadings from ground water, require the installation of OSDS that reduce total nitrogen loadings by 50 percent to ground water that is closely hydrologically connected to surface water.*

8. Operating Onsite Disposal Systems Management Measure

- (1) Establish and implement policies and systems to ensure that existing OSDS are operated and maintained to prevent the discharge of pollutants to the surface of the ground and to the extent practicable reduce the discharge of pollutants into ground waters that are closely hydrologically connected to surface waters. Where necessary to meet these objectives, encourage the reduced use of garbage disposals, encourage*

the use of low-volume plumbing fixtures, and reduce total phosphorus loadings to the OSDS by 15 percent (if the use of low-level phosphate detergents has not been required or widely adopted by OSDS users). Establish and implement policies that require an OSDS to be repaired, replaced, or modified where the OSDS fails, or threatens or impairs surface waters;

(2) Inspect OSDS at a frequency adequate to ascertain whether OSDS are failing;

(3) Consider replacing or upgrading OSDS to treat influent so that total nitrogen loadings in the effluent are reduced by 50 percent. This provision applies only:

- (a) where conditions indicate that nitrogen-limited surface waters may be adversely affected by significant ground water nitrogen loadings from OSDS;*
- (b) where nitrogen loadings from OSDS are delivered to ground water that is closely hydrologically connected to surface water.*

9. Pollution Prevention Management Measure

Implement pollution prevention and education programs to reduce nonpoint source pollutants generated from the following activities, where applicable:

- o The improper storage, use and disposal of household hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc.,*
- o Lawn and garden activities, including the application and disposal of lawn and garden care products, and the improper disposal of leaves and yard trimmings;*
- o Turf management on golf courses, parks, and recreational areas;*
- o Improper operation and maintenance of onsite disposal systems;*
- o Discharge of pollutants into storm drains including floatables, waste oil, and litter;*
- o Commercial activities including parking lots, gas stations, and other entities not under NPDES purview; and*
- o Improper disposal of pet excrement.*

10. Management Measure for Planning, Siting, and Developing Roads and Highways

Plan, site, and develop roads and highways to:

- (1) Protect areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss; and*
- (2) Limit land disturbance such as clearing and grading and cut and fill to reduce erosion and sediment loss; and*
- (3) Limit disturbance of natural drainage features and vegetation.*

11. Management Measure for Bridges

Site, design, and maintain bridge structures so that sensitive and valuable aquatic ecosystems and areas providing important water quality benefits are protected from adverse effects.

12. Management Measure for Construction Projects

- (1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction and;*
- (2) Prior to land disturbance, prepare and implement an approved erosion control plan or similar administrative document that contains erosion and sediment control provisions.*

13. Management Measure for Construction Site Chemical Control

- (1) Limit the application, generation, and migration of toxic substances;*
- (2) Ensure the proper storage and disposal of toxic materials; and*
- (3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface water.*

14. Management Measure for Operation and Maintenance

Incorporate pollution prevention procedures into the operation and maintenance of roads, highways, and bridges to reduce pollutant loadings to surface waters.

15. Management Measure for Road, Highway, and Bridge Runoff Systems

Develop and implement runoff management systems for existing roads, highways, and bridges to reduce runoff pollutant concentrations and volumes entering surface waters.

(1) Identify priority and watershed pollutant reduction opportunities (e.g., improvements to existing urban runoff control structures; and

(2) Establish schedules for implementing appropriate controls.

3. Management Measures for Forestry

1. Preharvest Planning

Perform advance planning for forest harvesting that includes the following elements where appropriate:

(1) Identify the area to be harvested including location of waterbodies and sensitive areas such as wetlands, threatened or endangered aquatic species habitat areas, or high-erosion-hazard areas (landslide-prone areas) within the harvest unit.

(2) Time the activity for the season or moisture conditions when the least impact occurs.

(3) Consider potential water quality impacts and erosion and sedimentation control in the selection of silvicultural and regeneration systems, especially for harvesting and site preparation.

(4) Reduce the risk of occurrence of landslides and severe erosion by identifying high-erosion-hazard areas and avoiding harvesting in such areas to the extent practicable.

(5) Consider additional contributions from harvesting or roads to any known existing water quality impairments or problems in watersheds of concern.

Perform advance planning for forest road systems that includes the following elements where appropriate:

(1) Locate and design road systems to minimize, to the extent practicable, potential sediment generation and delivery to surface waters. Key components are:

- o locate roads, landings, and skid trails to avoid to the extent practicable steep grades and steep hillside areas, and to decrease the number of stream crossings;*
- o avoid to the extent practicable locating new roads and landings in Streamside Management Areas (SMAs); and*
- o determine road usage and select the appropriate road standard.*

(2) Locate and design temporary and permanent stream crossings to prevent failure and control impacts from the road system. Key components are:

- o size and site crossing structures to prevent failure;*
- o for fish-bearing streams, design crossings to facilitate fish passage.*

(3) Ensure that the design of road prism and the road surface drainage are appropriate to the terrain and that road surface design is consistent with the road drainage structures.

(4) Use suitable materials to surface roads planned for all-weather use to support truck traffic.

(5) Design road systems to avoid high erosion or landslide hazard areas.

Identify these areas and consult a qualified specialist for design of any roads that must be constructed through these areas.

Each state should develop a process (or utilize an existing process) that ensures that the management measures in the chapter are implemented. Such a process should include appropriate notification, compliance audits, or other mechanisms for forestry activities with the potential for significant adverse nonpoint effects based on the type and size of operation and the presence of stream crossings or SMAs.

2. Streamside Management Areas (SMAs)

Establish and maintain a streamside management area along surface waters, which is sufficiently wide and which includes a sufficient number of canopy species to buffer against detrimental changes in the temperature regime of the waterbody, to provide bank stability, and to withstand wind damage. Manage the SMA in such a way as to protect against soil disturbance in the SMA and delivery to the stream of sediments and nutrients generated by forestry activities, including harvesting. Manage the SMA

canopy species to provide a sustainable source of large woody debris needed for instream channel structure and aquatic species habitat.

3. Road Construction/Reconstruction

- (1) Follow preharvest planning (as described under Management Measure 1) when constructing or reconstructing the roadway.*
- (2) Follow designs planned under Management Measure 1 for road surfacing and shaping.*
- (3) Install road drainage structures according to designs planned under Management Measure 1 and regional storm return period and installation specifications. Match these drainage structures with terrain features and with road surface and prism designs.*
- (4) Guard against the production of sediment when installing stream crossings.*
- (5) Protect surface waters from slash and debris material from roadway clearing.*
- (6) Use straw bales, silt fences, mulching, or other favorable practices on disturbed soils on unstable cuts, fills, etc.*
- (7) Avoid constructing new roads in SMAs to the extent practicable.*

4. Road Management

- (1) Avoid using roads where possible for timber hauling or heavy traffic during wet or thaw periods on roads not designed and constructed for these conditions.*
- (2) Evaluate the future need for a road and close roads that will not be needed. Leave closed roads and drainage channels in a stable condition to withstand storms.*
- (3) Remove drainage crossings and culverts if there is a reasonable risk of plugging or failure from lack of maintenance.*
- (4) Following completion of harvesting, close and stabilize temporary spur roads and seasonal roads to control and direct water away from the roadway. Remove all temporary stream crossings.*
- (5) Inspect roads to determine the need for structural maintenance. Conduct maintenance practices, when conditions warrant, including cleaning and replacement of deteriorated structures and erosion controls, grading or seeding of road surfaces, and, in extreme cases, slope stabilization or removal of road fills where necessary to maintain structural integrity.*
- (6) Conduct maintenance activities, such as dust abatement, so that chemical contaminants or pollutants are not introduced into surface waters to the extent practicable.*
- (7) Properly maintain permanent stream crossings and associated fills and approaches to reduce the likelihood (a) that stream overflow will divert onto roads, and (b) that fill erosion will occur if the drainage structures become obstructed.*

5. Timber Harvesting

The timber harvesting management measure consists of implementing the following:

- (1) Timber harvesting operations with skid trails or cable yarding follow layouts determined under Management Measure 1.*
- (2) Install landing drainage structures to avoid sedimentation to the extent practicable. Disperse landing drainage over sideslopes.*
- (3) Construct landings away from steep slopes and reduce the likelihood of fill slope failures. Protect landing surfaces used during wet periods. Locate landings outside of SMAs.*
- (4) Protect stream channels and significant ephemeral drainages from logging debris and slash material.*

(5) Use appropriate areas for petroleum storage, draining, dispensing. Establish procedures to contain and treat spills. Recycle or properly dispose of all waste materials.

For cable yarding:

- (1) Limit yarding corridor gouge or soil plowing by properly locating cable yarding landings.*
- (2) Locate corridors for SMAs following Management Measure 2.*

For groundskidding:

- (1) Within SMAs, operate groundskidding equipment only at stream crossings to the extent practicable. In SMAs, fell and endline trees to avoid sedimentation.*
- (2) Use improved stream crossings for skid trails which cross flowing drainages. Construct skid trails to disperse runoff and with adequate drainage structures.*
- (3) On steep slopes, use cable systems rather than groundskidding where groundskidding may cause excessive sedimentation.*

6. Site Preparation and Forest Regeneration

Confine on-site potential NPS pollution and erosion resulting from site preparation and the regeneration of forest stands. The components of the management measure for site preparation and regeneration are:

- (1) Select a method of site preparation and regeneration suitable for the site conditions.*
- (2) Conduct mechanical tree planting and ground-disturbing site preparation activities on the contour of sloping terrain.*
- (3) Do not conduct mechanical site preparation and mechanical tree planting in streamside management areas.*
- (4) Protect surface waters from logging debris and slash material.*
- (5) Suspend operations during wet periods if equipment used begins to cause excessive soil disturbance that will increase erosion.*
- (6) Locate windrows at a safe distance from drainages and SMAs to control movement of the material during high runoff conditions.*
- (7) Conduct bedding operations in high-water-table areas during dry periods of the year. Conduct bedding in sloping areas on the contour.*
- (8) Protect small ephemeral drainages when conducting mechanical tree planting.*

7. Fire Management

Prescribe fire for site preparation and control or suppress wildfire in a manner which reduces potential nonpoint source pollution of surface waters:

- (1) Intense prescribed fire should not cause excessive sedimentation due to the combined effect of removal of canopy species and the loss of soil-binding ability of subcanopy and herbaceous vegetation roots, especially in SMAs, in streamside vegetation for small ephemeral drainages, or on very steep slopes.*
- (2) Prescriptions for prescribed fire should protect against excessive erosion or sedimentation to the extent practicable.*
- (3) All bladed firelines, for prescribed fire and wildfire, should be plowed on contour or stabilized with water bars and/or other appropriate techniques if needed to control excessive sedimentation or erosion of the fireline.*
- (4) Wildfire suppression and rehabilitation should consider possible NPS pollution of watercourses, while recognizing the safety and operational priorities of fighting wildfires.*

8. Revegetation of Disturbed Areas

Reduce erosion and sedimentation by rapid vegetation of areas disturbed by harvesting operations or road construction:

(1) Revegetate disturbed areas (using seeding or planting) promptly after completion of the earth-disturbing activity. Local growing conditions will dictate the timing for establishment of vegetative cover.

(2) Use mixes of species and treatments developed and tailored for successful vegetation establishment for the region or area.

(3) Concentrate revegetation efforts initially on priority areas such as disturbed areas in SMAs or the steepest areas of disturbance near drainages.

9. Forest Chemical Management

Use chemicals when necessary for forest management in accordance with the following to reduce nonpoint source pollution impacts due to the movement of forest chemicals off-site during and after application:

(1) Conduct applications by skilled and, where required, licensed applicators according to the registered use, with special consideration given to impacts to nearby surface waters.

(2) Carefully prescribe the type and amount of pesticides appropriate for the insect, fungus, or herbaceous species.

(3) Prior to applications of pesticides and fertilizers, inspect the mixing and loading process and the calibration of equipment, and identify the appropriate weather conditions, the spray area, and buffer areas for surface waters.

(4) Establish and identify buffer areas for surface waters. (This is especially important for aerial applications.)

(5) Immediately report accidental spills of pesticides or fertilizers into surface waters to the appropriate State agency. Develop an effective spill contingency plan to contain spills.

10. Wetlands Forest

Plan, operate, and manage normal, ongoing forestry activities (including harvesting, road design and construction, site preparation and regeneration, and chemical management) to adequately protect the aquatic functions of forested wetlands.

4. Management Measures for Marinas and Recreational Boating

Siting and Design

1. Marina Flushing Management Measure

Site and design marinas such that tides and/or currents will aid in flushing of the site or renew its water regularly.

2. Water Quality Assessment Management Measure

Assess water quality as part of marina siting and design.

3. Habitat Assessment Management Measure

Site and design marinas to protect against adverse effects on shellfish resources, wetlands, submerged aquatic vegetation, or other important riparian and aquatic habitat areas as designated by local, State, or Federal governments.

4. Shoreline Stabilization Management Measure

Where shoreline erosion is a nonpoint source pollution problem, shorelines should be stabilized. Vegetated methods are strongly preferred unless structural methods are more cost effective, considering the severity of wave and wind erosion,

offshore bathymetry, and the potential adverse impact on other shorelines and offshore areas

5. Storm Water Runoff Management Measure

Implement effective runoff control strategies which include the use of pollution prevention activities and the proper design of hull maintenance areas. Reduce the average annual loadings of total suspended solids (TSS) in runoff from hull maintenance areas by 80 percent. For the purposes of this measure, an 80 percent reduction of TSS is to be determined on an average annual basis.

6. Fueling Station Design Management Measure

Design fueling stations to allow for ease in cleanup of spills.

7. Sewage Facility Management Measure

Install pumpout, dump station, and restroom facilities where needed at new and expanding marinas to reduce the release of sewage to surface waters. Design these facilities to allow ease of access and post signage to promote use by the boating public.

Operation and Maintenance

1. Solid Waste Management Measure

Properly dispose of solid wastes produced by the operation, cleaning, maintenance, and repair of boats to limit entry of solid wastes to surface waters.

2. Fish Waste Management Measure

Promote sound fish waste management through a combination of fish-cleaning restrictions, public education, and proper disposal of fish waste.

3. Liquid Material Management Measure

Provide and maintain appropriate storage, transfer, containment, and disposal facilities for liquid material, such as oil, harmful solvents, antifreeze, and paints, and encourage recycling of these materials.

4. Petroleum Control Management Measure

Reduce the amount of fuel and oil from boat bilges and fuel tank air vents entering marina and surface waters.

5. Boat Cleaning Management Measure

For boats that are in the water, perform cleaning operations to minimize, to the extent practicable, the release to surface waters of (a) harmful cleaners and solvents and (b) paint from in-water hull cleaning.

6. Public Education Management Measure

Public education/outreach/training programs should be instituted for boaters, as well as marina owners and operators, to prevent improper disposal of polluting material.

7. Maintenance of Sewage Facilities Management Measure

Ensure that sewage pumpout facilities are maintained in operational condition and encourage their use.

8. Boat Operation Management Measure (applies to boating only)

Restrict boating activities where necessary to decrease turbidity and physical destruction of shallow-water habitat.

5. Management Measures for Hydromodification

Channelization and Channel Modification

1. Management Measure for Physical and Chemical Characteristics of Surface Waters

- (1) Evaluate the potential effects of proposed channelization and channel modification on the physical and chemical characteristics of surface waters in coastal areas;*
- (2) Plan and design channelization and channel modification to reduce undesirable impacts; and*
- (3) Develop an operation and maintenance program for existing modified channels that includes identification and implementation of opportunities to improve physical and chemical characteristics of surface waters in those channels.*

2. Instream and Riparian Habitat Restoration Management Measure

- (1) Evaluate the potential effects of proposed channelization and channel modification on instream and riparian habitat in coastal areas;*
- (2) Plan and design channelization and channel modification to reduce undesirable impacts; and*
- (3) Develop an operation and maintenance program with specific timetables for existing modified channels that includes identification of opportunities to restore instream and riparian habitat in those channels.*

Dams

1. Management Measure for Erosion and Sediment Control

- (1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction, and*
- (2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.*

2. Management Measure for Chemical and Pollutant Control

- (1) Limit application, generation, and migration of toxic substances;*
- (2) Ensure the proper storage and disposal of toxic materials; and,*
- (3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.*

3. Management Measure for Protection of Surface Water Quality and Instream and Riparian Habitat

Develop and implement a program to manage the operation of dams in coastal areas that includes an assessment of:

- (1) Surface water quality and instream and riparian habitat and potential for improvement and*
- (2) Significant nonpoint source pollution problems that result from excessive surface water withdrawals.*

Streambank and Shoreline Erosion

1. Management Measure for Eroding Streambanks and Shorelines

(1) Where streambank or shoreline erosion is a nonpoint source pollution problem, streambanks and shorelines should be stabilized. Vegetative methods are strongly

preferred unless structural methods are more cost-effective, considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other streambanks, shorelines, and offshore areas.

(2) Protect streambank and shoreline features with the potential to reduce NPS pollution.

(3) Protect streambanks and shorelines from erosion due to uses of either the shorelands or adjacent surface waters.

6. Management Measures for Wetlands, Riparian Areas and Vegetated Treatment Systems

1. Management Measure for Protection of Wetlands and Riparian Areas

Protect from adverse effects wetlands and riparian areas that are serving a significant NPS abatement function and maintain this function while protecting the other existing functions of these wetlands and riparian areas as measured by characteristics such as vegetative composition and cover, hydrology of surface water and ground water, geochemistry of the substrate, and species composition.

2. Management Measure for Restoration of Wetland and Riparian Areas

Promote the restoration of the preexisting functions in damaged and destroyed wetlands and riparian systems in areas where the systems will serve a significant NPS pollution abatement function.

3. Management Measure for Vegetated Treatment Systems

Promote the use of engineered vegetated treatment systems such as constructed wetlands or vegetated filter strips where these systems will serve a significant NPS pollution abatement function.